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=> fil reg
FILE 'REGISTRY' ENTERED AT 08:31:11 ON 26 JAN 2009
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STRUCTURE FILE UPDATES:   25 JAN 2009  HIGHEST RN 1095751-06-6
DICTIONARY FILE UPDATES:  25 JAN 2009  HIGHEST RN 1095751-06-6

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on property searching in REGISTRY, refer to:

http://www.cas.org/support/stngen/stndoc/properties.html

=> d que l32
L2            16 SEA FILE=REGISTRY ABB=ON  PLU=ON  (161000-64-2/BI OR
                 100-37-8/BI OR 102-71-6/BI OR 109-89-7/BI OR 110-89-4/BI
                 OR 113923-91-4/BI OR 121-44-8/BI OR 141098-23-9/BI OR
                 142-84-7/BI OR 29295-80-5/BI OR 352211-30-4/BI OR 438245-54
                 -6/BI OR 742079-37-4/BI OR 742079-38-5/BI OR 742079-40-9/BI
                  OR 78-81-9/BI)
L3               STR
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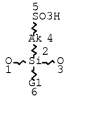


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DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   6

STEREO ATTRIBUTES: NONE
L5             9 SEA FILE=REGISTRY ABB=ON  PLU=ON  L2 AND S/ELS
L6           200 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L5
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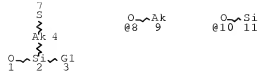

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NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
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GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 9

STEREO ATTRIBUTES: NONE
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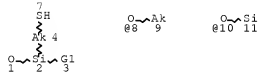
L14 125 SEA FILE=REGISTRY SUB=L11 SSS FUL L3
L15 STR



VAR G1=O/AK/8/10
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 9

STEREO ATTRIBUTES: NONE
L17 1956 SEA FILE=REGISTRY SUB=L11 SSS FUL L15
L18 133 SEA FILE=HCAPLUS ABB=ON PLU=ON L14
L19 6250 SEA FILE=HCAPLUS ABB=ON PLU=ON L17
L20 33 SEA FILE=HCAPLUS ABB=ON PLU=ON L18 AND PROTON(2A)CONDUCT?

L21 1517 SEA FILE=HCAPLUS ABB=ON PLU=ON L19(L)PREP/RL
L28 30 SEA FILE=HCAPLUS ABB=ON PLU=ON L18 AND ((EXCHANG? OR CONDUCT?)(2A)MEMBRAN? OR PEM OR MEA OR MEMBRANE ELECTRODE ASSEMBLY?)
L29 46 SEA FILE=HCAPLUS ABB=ON PLU=ON L21 AND ((EXCHANG? OR CONDUCT?)(2A)MEMBRAN? OR PEM OR MEA OR MEMBRANE ELECTRODE ASSEMBLY?)
L30 17 SEA FILE=HCAPLUS ABB=ON PLU=ON L6 AND ((EXCHANG? OR CONDUCT?)(2A)MEMBRAN? OR PEM OR MEA OR MEMBRANE ELECTRODE ASSEMBLY?)
L31 39 SEA FILE=HCAPLUS ABB=ON PLU=ON L20 OR L28
L32 14 SEA FILE=HCAPLUS ABB=ON PLU=ON L31 AND (L30 OR L29)

```
=> fil hcap
FILE 'HCAPLUS' ENTERED AT 08:31:33 ON 26 JAN 2009
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FILE COVERS 1907 - 26 Jan 2009 VOL 150 ISS 5
FILE LAST UPDATED: 25 Jan 2009 (20090125/ED)

HCAplus now includes complete International Patent Classification (IPC) reclassification data for the third quarter of 2008.

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This file contains CAS Registry Numbers for easy and accurate substance identification.

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=> d l32 1-14 ibib ed abs hitstr hitind
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L32 ANSWER 1 OF 14 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2008:1157649 HCAPLUS Full-text
DOCUMENT NUMBER: 149:405507
TITLE: Membrane-electrode bonding agent, bonding layer attached proton-conductive membrane, membrane-electrode assembly, solid polymer fuel cell, and method for producing membrane-electrode assembly
INVENTOR(S): Miyama, Toshihito; Konno, Yoshiharu; Nakajima, Hideyasu; Kanoh, Masashi
PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan
SOURCE: PCT Int. Appl., 66pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2008114664	A1	20080925	WO 2008-JP54527	20080312
W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT,				

LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI,
NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK,
SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC,
VN, ZA, ZM, ZW
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR,
HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE,
SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,
NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ,
TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

PRIORITY APPLN. INFO.: JP 2007-69493 A 20070316

JP 2007-193697 A 20070725

JP 2007-340452 A 20071228

ED Entered STN: 26 Sep 2008

AB The membrane-electrode bonding agent, for bonding a proton- conductive membrane with electrodes arranged on both sides of the proton-conductive membrane, contains a crosslinkable compound (X) having a Si-O bond, a polymer material (Y) containing an acid group, and a hydrophilic resin (Z) containing no acid group. The bonding layer attached proton- conductive membrane has a bonding layer formed from the membrane-electrode bonding agent and arranged on one or both sides of the proton-conductive membrane. The membrane-electrode assembly has the bonding layer attached proton-conductive membrane arranged between a cathode and an anode; and is manufactured by applying the membrane-electrode bonding agent on both sides of the proton-conductive membrane, drying to form the bonding layer attached proton- conductive membrane, softening or swelling the bonding layer attached proton-conductive membrane by impregnating the bonding layer attached proton-conductive membrane with a solvent, pasting the anode and the cathode on the membrane, and hot pressing. The solid polymer fuel cell has the membrane- electrode assembly.

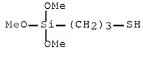
IT 161000-64-2, 3-Mercaptopropyl trimethoxy silane-tetraethoxy silane copolymer 1062141-03-0
(components of membrane-electrode bonding agents for membrane-electrode assemblies in fuel cells)

RN 161000-64-2 HCAPLUS

CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



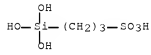
CM 2

CRN 78-10-4
CMF C8 H20 O4 Si

RN 1062141-03-0 HCAPLUS
CN 1-Propanesulfonic acid, 2-methyl-2-[(1-oxo-2-propen-1-yl)amino]-, polymer with 1,4-diethenylbenzene, ethenyltrimethoxysilane, silicic acid (H4SiO4) tetraethyl ester, 4,4,13,13-tetraethoxy-3,14-dioxa-4,13-disilahexadecane and 3-(trihydroxysilyl)-1-propanesulfonic acid (CA INDEX NAME)

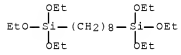
CM 1

CRN 70942-24-4
CMF C3 H10 O6 S Si



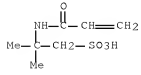
CM 2

CRN 52217-60-4
CMF C20 H46 O6 Si2



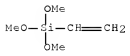
CM 3

CRN 15214-89-8
CMF C7 H13 N O4 S



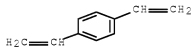
CM 4

CRN 2768-02-7
CMF C5 H12 O3 Si



CM 5

CRN 105-06-6
CMF C10 H10



CM 6

CRN 78-10-4
CMF C8 H20 O4 Si

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST fuel cell electrolyte membrane electrode assembly manuf bonding agent; proton conductive membrane bonding agent
IT 9002-84-0, PTFE 9002-88-4, Polyethylene 9002-89-5, Polyvinyl alcohol 25322-68-3, Polyethylene glycol 27119-07-9 69824-22-2 161000-64-3, 3-Mercaptopropyl trimethoxy silane-tetraethoxy silane copolymer 184843-15-0D, sulfonated 1062141-03-0
(components of membrane-electrode bonding agents for membrane-electrode assemblies in fuel cells)
REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 2 OF 14 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2007:1395577 HCAPLUS Full-text
DOCUMENT NUMBER: 148:34467
TITLE: Ion-conductive polymer composition, its production, film containing the ion conductive polymer composition, and electrochemical device using the film
INVENTOR(S): Watanabe, Masahiro; Miyatake, Kenji; Uchida, Hiroyuki
PATENT ASSIGNEE(S): University of Yamanashi, Japan
SOURCE: PCT Int. Appl., 20pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2007139147	A1	20071206	WO 2007-JP60987	20070530

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

PRIORITY APPLN. INFO.: JP 2006-150767 A 20060531

ED Entered STN: 07 Dec 2007

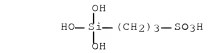
AB The ion conductive polymer composition which is improved in ion conductivity and usable under high temperature low humidity conditions, is obtained by mixing or combining a polymer compound (e.g., a cation-exchange resin) and a metal oxide compound containing an acidic group. In this composition, the acidic group and the metal oxide compound are preferably bound by an organic group, and a compound (R1O)aX(R2Y)b (R1 = H, metal ion, C1-20 hydrocarbyl; R2 = C1-20 hydrocarbyl; X = metal element; Y = acidic group and its precursor; a, b = 1-4) is preferable as the metal oxide compound The metal element in the metal oxide compound preferably contains silicon, titanium, aluminum or boron. The acidic group is preferably a sulfonic acid group, a phosphonic acid group or a carboxylic acid group.

IT 945714-84-1P
(ion-conductive polymer composition used in film for electrochem. device)

RN 945714-84-1 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)-, homopolymer (CA INDEX NAME)

CM 1

CRN 70942-24-4
CMF C3 H10 O6 S Si

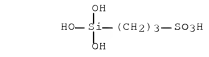


CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): 38, 52
IT Cation exchangers
Ion exchange membranes
Ionic conductors
(ion-conductive polymer composition used in film for electrochem. device)
IT 945714-84-1P
(ion-conductive polymer composition used in film for electrochem. device)
REFERENCE COUNT: 16 THERE ARE 16 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

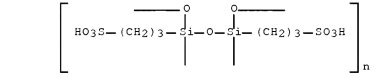
L32 ANSWER 3 OF 14 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2007:1044649 HCAPLUS Full-text
DOCUMENT NUMBER: 147:503213
TITLE: Enhanced proton conduction in polymer electrolyte membranes with acid-functionalized polysilsesquioxane
AUTHOR(S): Miyatake, Kenji; Tombe, Takahiro; Chikashige, Yohei; Uchida, Hiroyuki; Watanabe, Masahiro
CORPORATE SOURCE: Clean Energy Research Center, University of Yamanashi, 4 Takeda, Kofu, Yamanashi, 4008510, Japan
SOURCE: Angewandte Chemie, International Edition (2007), 46(35), 6646-6649
CODEN: ACIEF5; ISSN: 1433-7851
PUBLISHER: Wiley-VCH Verlag GmbH & Co. KGaA
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 18 Sep 2007
AB A simple but effective approach to improving the conducting properties of polymer electrolyte membranes has been developed by incorporating acid-functionalized polysilsesquioxane (SiOPS). The nanocomposite membranes showed 30 times higher proton conductivity than that of the original membrane and may find application in sensors, batteries, and most likely fuel cells.
IT 945714-84-1P 955043-96-6P
(enhanced proton conduction in polymer electrolyte membranes with acid- functionalized polysilsesquioxane)
RN 945714-84-1 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)-, homopolymer (CA INDEX NAME)

CM 1

CRN 70942-24-4
CMF C3 H10 O6 S Si



RN 955043-96-6 HCAPLUS
CN Poly[[1,3-bis(3-sulfopropyl)-1,3:1,3-disiloxanediylidene]-1,3-bis(oxy)] (CA INDEX NAME)



CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 37
ST silsesquioxane electrolyte nanocomposite membrane proton cond
IT Named reagents and solutions
(Fenton's; enhanced proton conduction in polymer electrolyte membranes with acid- functionalized polysilsesquioxane)
IT Membranes, nonbiological
(composite; enhanced proton conduction in polymer electrolyte membranes with acid- functionalized polysilsesquioxane)
IT Polymer morphology
(domain; enhanced proton conduction in polymer electrolyte membranes with acid- functionalized polysilsesquioxane)
IT Hybrid organic-inorganic materials
Particle size
Polyelectrolytes
Polymer chains
Steam
Thermal stability
(enhanced proton conduction in polymer electrolyte membranes with acid- functionalized polysilsesquioxane)
IT Casting of polymeric materials
(film; enhanced proton conduction in polymer electrolyte membranes with acid- functionalized polysilsesquioxane)
IT Polysulfones, uses
(polyether-, sulfonated; enhanced proton conduction in polymer electrolyte membranes with acid-functionalized polysilsesquioxane)
IT Sol-gel processing
(polymerization; enhanced proton conduction in polymer electrolyte membranes with acid- functionalized polysilsesquioxane)
IT Polyethers, uses
(polysulfone-, sulfonated; enhanced proton conduction in polymer electrolyte membranes with acid-functionalized polysilsesquioxane)

IT Ionic conductivity
(proton; enhanced proton conduction in polymer electrolyte membranes with acid- functionalized polysilsesquioxane)
IT Oxidation
(resistance; enhanced proton conduction in polymer electrolyte membranes with acid- functionalized polysilsesquioxane)
IT Polymerization
(sol-gel; enhanced proton conduction in polymer electrolyte membranes with acid- functionalized polysilsesquioxane)
IT Hydrolysis
(stability; enhanced proton conduction in polymer electrolyte membranes with acid- functionalized polysilsesquioxane)
IT Silsesquioxanes
(sulfonated; enhanced proton conduction in polymer electrolyte membranes with acid- functionalized polysilsesquioxane)
IT Polyimides, uses
(sulfonated; enhanced proton conduction in polymer electrolyte membranes with acid- functionalized polysilsesquioxane)
IT 7732-18-5, Water, processes
(absorption; enhanced proton conduction in polymer electrolyte membranes with acid- functionalized polysilsesquioxane)
IT 40793-51-9
(assumed monomers; enhanced proton conduction in polymer electrolyte membranes with acid- functionalized polysilsesquioxane)
IT 945714-84-1P 955043-96-6P
(enhanced proton conduction in polymer electrolyte membranes with acid- functionalized polysilsesquioxane)
IT 40883-82-7D, sulfonated 736141-99-4
(enhanced proton conduction in polymer electrolyte membranes with acid- functionalized polysilsesquioxane)
REFERENCE COUNT: 26 THERE ARE 26 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 4 OF 14 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2007:729316 HCAPLUS Full-text
DOCUMENT NUMBER: 147:98506
TITLE: Securely bonded membrane electrode assemblies, manufacture thereof by crosslinking while platinum catalyst precipitation, and polymer electrolyte fuel cells therewith
INVENTOR(S): Miyama, Toshihito; Konno, Yoshiharu; Koma, Satoshi
PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 22pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007172871	A	20070705	JP 2005-364782	20051219

PRIORITY APPLN. INFO.: JP 2005-364782 20051219

ED Entered STN: 06 Jul 2007

AB The process for manufacturing the membrane electrode assemblies (MEAs) comprises (i) impregnating porous polymer membranes with SH- and/or SO3H-containing compds. also having covalently bonded hydrolyzable silyl or silanol groups [A; e.g., HS(CH2)3Si(OMe)3, (HO)3Si(CH2)3SO3H], (ii) sandwiching the membranes between electron conductor-containing electrodes, (iii) (hydrolytically) condensing the silyl and/or the silanol groups to bond the membranes with the electrodes, (iv) substituting protons of the SO3H groups, at membrane-electrode interfaces, with metal ion-containing cations [e.g., [Pt(NH3)4]2+], (v) oxidizing the SH groups into SO3H, and (vi) reducing the metal ions into metal particles to be precipitated Or, the electrodes are preliminary impregnated with the metal ions before the sandwiching, followed by condensation of the silyl/silanol groups giving continuous particles with crosslinked Si-O structures. Alternatively, the process comprises (i) complexing porous polymer membranes with covalently bonded SH- and/or SO3H-containing crosslinked Si-O structures, (ii) impregnating electrodes with the above compds. A and metal ions, (iii) condensing the silyl/silanol groups to give continuous particles with crosslinked Si-O structures, (iv) laminating the membranes with the electrodes, (v) oxidizing, and (vi) reducing. MEAs manufactured as above have high catalyst utilization efficiency and are useful for direct methanol fuel cells.

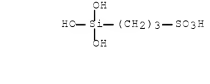
IT 154619-15-5DP, [Pt(NH3)4]2+ salt, reduced
161000-64-2DP, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, oxidized, [Pt(NH3)4]2+ salt, reduced
(manufacture of polymer electrolyte fuel cell MEAs securely bonding membranes and electrodes by crosslinking while releasing Pt catalyst precipitation)

RN 154619-15-5 HCAPLUS

CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)-, polymer with silicic acid (H4SiO4) tetraethyl ester (CA INDEX NAME)

CM 1

CRN 70942-24-4
CMF C3 H10 O6 S Si



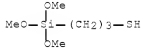
CM 2

CRN 78-10-4
CMF C8 H20 O4 Si

RN 161000-64-2 HCAPLUS
CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

CRN 78-10-4
CMF C8 H20 O4 Si

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 67
ST mercaptopropyltrimethoxysilane ethoxysilane copolymer oxidized platinum salt reduced electrocatalyst pptn; PEFC membrane electrode secure bonding silanol alkoxysilyl crosslinking; polymer electrolyte fuel cell platinum catalyst pptn; porous polyethylene membrane mercaptopropyltrimethoxysilane ethoxysilane impregnation crosslinking PEFC; direct methanol fuel cell MEA
hydroxysilylpropanesulfonic acid ethoxysilane copolymer
IT Carbon black, uses
(Denka Black AB 12, gas-diffusion layers in electrodes; manufacture of polymer electrolyte fuel cell MEAs securely bonding membranes and electrodes by crosslinking while releasing Pt catalyst precipitation)
IT Graphitized carbon black
(Ketjen Black EC, gas-diffusion layers in electrodes; manufacture of polymer electrolyte fuel cell MEAs securely bonding membranes and electrodes by crosslinking while releasing Pt catalyst precipitation)
IT Catalysts
(electrocatalysts; manufacture of polymer electrolyte fuel cell MEAs securely bonding membranes and electrodes by crosslinking while releasing Pt catalyst precipitation)

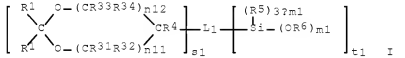
IT Reduction
(for precipitation of metal electrocatalysts; manufacture of polymer electrolyte
fuel cell MEAs securely bonding membranes and electrodes by crosslinking while releasing Pt catalyst precipitation)
IT Crosslinking
(for securely bonding membranes and electrodes; manufacture of polymer electrolyte fuel cell MEAs securely bonding membranes and electrodes by crosslinking while releasing Pt catalyst precipitation)
IT Impregnation
(manufacture of polymer electrolyte fuel cell MEAs securely bonding membranes and electrodes by crosslinking while releasing Pt catalyst precipitation)
IT Oxidation
(of sulfides; manufacture of polymer electrolyte fuel cell MEAs securely bonding membranes and electrodes by crosslinking while releasing Pt catalyst precipitation)
IT Fuel cells
(polymer electrolyte; manufacture of polymer electrolyte fuel cell MEAs securely bonding membranes and electrodes by crosslinking while releasing Pt catalyst precipitation)
IT Silsesquioxanes
(silicate-; manufacture of polymer electrolyte fuel cell MEAs securely bonding membranes and electrodes by crosslinking while releasing Pt catalyst precipitation)
IT 9002-88-4, Polyethylene
(Solupor 10P05A, porous membranes; manufacture of polymer electrolyte fuel cell MEAs securely bonding membranes and electrodes by crosslinking while releasing Pt catalyst precipitation)
IT 291280-30-3, TGP-H 120
(electrodes; manufacture of polymer electrolyte fuel cell MEAs securely bonding membranes and electrodes by crosslinking while releasing Pt catalyst precipitation)
IT 7440-06-4P, Platinum, uses
(manufacture of polymer electrolyte fuel cell MEAs securely bonding membranes and electrodes by crosslinking while releasing Pt catalyst precipitation)
IT 154619-15-5DP, [Pt(NH3)4]2+ salt, reduced
161000-64-2DP, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, oxidized, [Pt(NH3)4]2+ salt, reduced
(manufacture of polymer electrolyte fuel cell MEAs securely bonding membranes and electrodes by crosslinking while releasing Pt catalyst precipitation)
IT 13933-32-9, Tetraammineplatinum dichloride
(manufacture of polymer electrolyte fuel cell MEAs securely bonding membranes and electrodes by crosslinking while releasing Pt catalyst precipitation)
IT 7440-44-0, Carbon, uses
(paper, electrodes; manufacture of polymer electrolyte fuel cell MEAs securely bonding membranes and electrodes by crosslinking while releasing Pt catalyst precipitation)

L32 ANSWER 5 OF 14 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2005:1074041 HCAPLUS Full-text
DOCUMENT NUMBER: 143:369971
TITLE: Sol-gel reaction products, solid electrolytes, protonic conductors, and membrane-electrode assemblies for fuel cells
INVENTOR(S): Wariishi, Koji

PATENT ASSIGNEE(S): Fuji Photo Film Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 40 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005272556	A	20051006	JP 2004-86053	20040324
JP 4149950	B2	20080917		
PRIORITY APPLN. INFO.:			JP 2004-86053	20040324

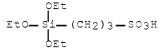
OTHER SOURCE(S): MARPAT 143:369971
ED Entered STN: 07 Oct 2005
GI



AB The reaction products are prepared from I (R1, R2 = H, alkyl, aryl, heterocyclic ring, R1 and R2 may link together to form a ring; R31, R32, R33, R34, R4 = H, alkyl, aryl, heterocyclic ring; R5 = alkyl, aryl, heterocyclic ring; R6 = H, alkyl, aryl, silyl; m1 = 1-3; n11, n12 = 0-4; L1 = single bond, linkage group with valency (s1 + t1); s1, t1 = 1-4), and compds. having proton-donating substituent groups. The protonic conductors show high protonic conductivity and low methanol permeability.

IT 260784-99-4P
(preparation of proton-donating compds. for sol-gel reaction products for protonic conductors of fuel cells)

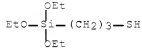
RN 260784-99-4 HCAPLUS
CN 1-Propanesulfonic acid, 3-(triethoxysilyl)- (CA INDEX NAME)



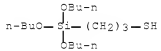
IT 14814-09-6DP, 3-Mercaptopropyltriethoxysilane, oxidized, polymers with cyclic acetal-containing alkoxysilanes and alkoxysilanes 42169-84-6DP, 3-Mercaptopropyltributoxysilane, oxidized, polymers with cyclic acetal-containing alkoxysilanes and alkoxysilanes 62896-03-1DP, oxidized, polymers with cyclic acetal-containing alkoxysilanes and alkoxysilanes 260784-99-4DP, polymers with cyclic acetal-containing alkoxysilanes and alkoxysilanes 866228-58-2P
(sol-gel reaction products of cyclic acetal-containing alkoxysilanes

and proton-donating compds. for protonic conductors of fuel cells)

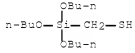
RN 14814-09-6 HCAPLUS
CN 1-Propanethiol, 3-(triethoxysilyl)- (CA INDEX NAME)



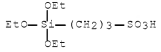
RN 42169-84-6 HCAPLUS
CN 1-Propanethiol, 3-(tributoxysilyl)- (CA INDEX NAME)



RN 62896-03-1 HCAPLUS
CN Methanethiol, 1-(tributoxysilyl)- (CA INDEX NAME)



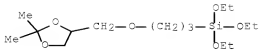
RN 260784-99-4 HCAPLUS
CN 1-Propanesulfonic acid, 3-(triethoxysilyl)- (CA INDEX NAME)



RN 866228-58-2 HCAPLUS
CN 1-Propanesulfonic acid, 3-(triethoxysilyl)-, polymer with [3-[(2,2-dimethyl-1,3-dioxolan-4-yl)methoxy]propyl]triethoxysilane and 4,4,13,13-tetraethoxy-3,14-dioxa-4,13-disilahexadecane (9CI) (CA INDEX NAME)

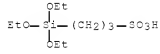
CM 1

CRN 863015-08-1
CMF C15 H32 O6 Si



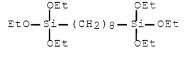
CM 2

CRN 260784-99-4
CMF C9 H22 O6 S Si



CM 3

CRN 52217-60-4
CMF C20 H46 O6 Si2



IC ICM C08G077-28
ICS C08G077-48; H01B001-06; H01M008-02; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 76
IT 260784-99-4P
(preparation of proton-donating compds. for sol-gel reaction products for protonic conductors of fuel cells)
IT 2530-83-8DP, Glycidoxypropyltrimethoxysilane, polymers with oxidized mercaptoalkyltrialkoxysilanes and cyclic acetal-containing alkoxysilanes 14814-09-6DP, 3-Mercaptopropyltriethoxysilane, oxidized, polymers with cyclic acetal-containing alkoxysilanes and alkoxysilanes 42169-34-6DP, 3-Mercaptopropyltributoxysilane, oxidized, polymers with cyclic acetal-containing alkoxysilanes and alkoxysilanes 62856-03-1DP, oxidized, polymers with cyclic acetal-containing alkoxysilanes and alkoxysilanes 260784-99-4DP, polymers with cyclic acetal-containing alkoxysilanes and alkoxysilanes 863015-08-1DP, polymers with oxidized mercaptoalkyltrialkoxysilanes and alkoxysilanes 866228-58-2P 866228-59-3DP, polymers with oxidized mercaptoalkyltrialkoxysilanes and alkoxysilanes 866228-60-6DP,

polymers with oxidized mercaptoalkyltrialkoxysilanes and alkoxysilanes (sol-gel reaction products of cyclic acetal-containing alkoxysilanes and proton-donating compds. for protonic conductors of fuel cells)

L32 ANSWER 6 OF 14 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2005:729504 HCAPLUS Full-text
DOCUMENT NUMBER: 143:194672
TITLE: Heterocyclic monomers and related polymers and hybrid inorganic-organic polymer membranes
INVENTOR(S): Li, Siwen; Zhou, Zhen; Liu, Meilin; Li, Wen
PATENT ASSIGNEE(S): Toyota Technical Center, Usa Inc., USA; Georgia Tech Research Corporation
SOURCE: PCT Int. Appl., 49 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005072413	A2	20050811	WO 2005-US2922	20050127
WO 2005072413	A3	20060330		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW, SM				
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
US 20060111530	A1	20060525	US 2005-44527	20050126
CA 2555273	A1	20050811	CA 2005-2555273	20050127
EP 1713794	A2	20061025	EP 2005-712383	20050127
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, BA, HR, IS, YU				
CN 1926131	A	20070307	CN 2005-80006439	20050127
JP 2007523066	T	20070816	JP 2006-551531	20050127
PRIORITY APPLN. INFO.:			US 2004-539641P P	20040127
			US 2004-614814P P	20040930
			US 2005-44527 A	20050126
			WO 2005-US2922 W	20050127

OTHER SOURCE(S): MARPAT 143:194672
ED Entered STN: 11 Aug 2005
AB Polymers, useful for manufacture of proton-conducting membranes with high proton conductivity at low humidity, dense structure, and good mech. properties for fuel cells, have N-containing heterocycles with pKa < 5 attached to or included in the chains. Optionally, the polymers are inorg.-organic hybrids, which, optionally, have acid side groups. A typical polymer was manufactured by radical polymerization of 2-(2,6-dimethyl-5-heptenyl)-4-(trifluoromethyl)-1H- imidazole.

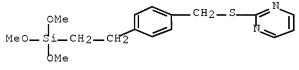
IT 862011-05-0P 862011-07-2P 862011-09-4P
(heterocyclic monomers and related proton-conductive polymers and (acid group-containing) hybrid inorg.-organic polymers for fuel cell membranes)

RN 862011-05-0 HCAPLUS

CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)-, polymer with α-(dimethoxymethylsilyl)-ω-[(dimethoxymethylsilyl)oxy]poly[oxy(methyl-1,2-ethanediyl)], 4,4,13,13-tetraethoxy-3,14-dioxa-4,13-disilahexadecane and 2-[[[4-[2-(trimethoxysilyl)ethyl]phenyl]methyl]thio]pyrimidine (9CI) (CA INDEX NAME)

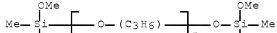
CM 1

CRN 861886-41-1
CMF C16 H22 N2 O3 S Si



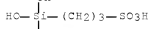
CM 2

CRN 77396-40-8
CMF (C3 H6 O)n C6 H18 O5 Si2
CCI IDS, PMS



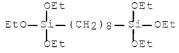
CM 3

CRN 70942-24-4
CMF C3 H10 O6 S Si



CM 4

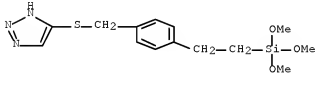
CRN 52217-60-4
CMF C20 H46 O6 Si2



RN 862011-07-2 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)-, polymer with α-(dimethoxymethylsilyl)-ω-[(dimethoxymethylsilyl)oxy]poly[oxy(methyl-1,2-ethanediyl)], 4,4,13,13-tetraethoxy-3,14-dioxa-4,13-disilahexadecane and 4-[[[4-[2-(trimethoxysilyl)ethyl]phenyl]methyl]thio]-1H-1,2,3-triazole (9CI) (CA INDEX NAME)

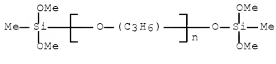
CM 1

CRN 861886-36-4
CMF C14 H21 N3 O3 S Si



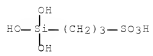
CM 2

CRN 77396-40-8
CMF (C3 H6 O)n C6 H18 O5 Si2
CCI IDS, PMS



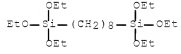
CM 3

CRN 70942-24-4
CMF C3 H10 O6 S Si



CM 4

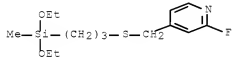
CRN 52217-60-4
CMF C20 H46 O6 Si2



RN 862011-09-4 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)-, polymer with 4-[[[3-(diethoxymethylsilyl)propyl]thio]methyl]-2-fluoropyridine, α-(dimethoxymethylsilyl)-ω-[(dimethoxymethylsilyl)oxy]poly[oxy(methyl-1,2-ethanediyl)] and 4,4,13,13-tetraethoxy-3,14-dioxa-4,13-disilahexadecane (9CI) (CA INDEX NAME)

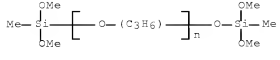
CM 1

CRN 861886-38-6
CMF C14 H24 F N O2 S Si



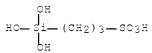
CM 2

CRN 77396-40-8
CMF (C3 H6 O)n C6 H18 O5 Si2
CCI IDS, PMS



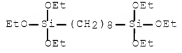
CM 3

CRN 70942-24-4
CMF C3 H10 O6 S Si



CM 4

CRN 52217-60-4
CMF C20 H46 O6 Si2



IC ICM C08J
CC 37-3 (Plastics Manufacture and Processing)
Section cross-reference(s): 52
ST nitrogen heterocyclic compd polymer proton conducting membrane fuel cell; methylheptenylfluoromethylimidazole homopolymer manuf
IT Fuel cell separators
Polyelectrolytes
(heterocyclic monomers and related proton-conductive polymers and (acid group-containing) hybrid inorg.-organic polymers for fuel cell membranes)
IT Fluoropolymers, preparation
(heterocyclic monomers and related proton-conductive polymers and (acid group-containing) hybrid inorg.-organic polymers for fuel cell membranes)
IT Silsesquioxanes
(polyoxyalkylene-polysiloxane-, silicate-; heterocyclic monomers and related proton-conductive polymers and (acid group-containing) hybrid inorg.-organic polymers for fuel cell membranes)
IT Polysiloxanes, preparation
(polyoxyalkylene-silsesquioxane-, silicate-; heterocyclic monomers and related proton-conductive polymers and (acid group-containing) hybrid inorg.-organic polymers for fuel cell membranes)
IT Polyoxyalkylenes, preparation

(polysiloxane-silsesquioxane-, silicate-; heterocyclic monomers and related proton-conductive polymers and (acid group-containing) hybrid inorg.-organic polymers for fuel cell membranes)

IT Conducting polymers
(proton-; heterocyclic monomers and related proton-conductive polymers and (acid group-containing) hybrid inorg.-organic polymers for fuel cell membranes)

IT Polysulfones, properties
(sulfonated, membrane matrix; heterocyclic monomers and related proton-conductive polymers and (acid group-containing) hybrid inorg.-organic polymers for fuel cell membranes)

IT 862011-03-8P 862011-05-0P 862011-07-2P 862011-09-4P
(heterocyclic monomers and related proton-conductive polymers and (acid group-containing) hybrid inorg.-organic polymers for fuel cell membranes)

IT 861886-20-6P, 2-(2,6-Dimethyl-5-heptenyl)-4-(trifluoromethyl)-1H-imidazole homopolymer 861886-21-7P, 2-(3-Butenyl)-4-trifluoromethyl)-1H-imidazole homopolymer 861886-22-8DP, 2-(3-Butenyl)-4-trifluoromethyl)-1H-imidazole-dimethyl perfluoro(3-vinylpropyl)phosphonate copolymer, hydrolyzed 861886-40-0P, 1-(4-Methoxybenzyl)-4-vinyl-1H-1,2,3-triazole homopolymer
(heterocyclic monomers and related proton-conductive polymers and (acid group-containing) hybrid inorg.-organic polymers for fuel cell membranes)

IT 7664-93-9, Sulfuric acid, properties
(heterocyclic monomers and related proton-conductive polymers and (acid group-containing) hybrid inorg.-organic polymers for fuel cell membranes)

IT 690628-59-2P, 5-[4-(3H-1,2,3-Triazol-4-ylthio)butylthio]-1H-1,2,3-triazole
(membrane component; heterocyclic monomers and related proton-conductive polymers and (acid group-containing) hybrid inorg.-organic polymers for fuel cell membranes)

IT 355430-48-7P 861886-23-9P, 5-[8-(3H-1,2,3-Triazol-4-ylthio)octylthio]-1H-1,2,3-triazole 861886-24-0P, 3-[8-(1H-1,2,4-Triazol-3-ylthio)octylthio]-1H-1,2,4-triazole 861886-25-1P, 1,2-Bis[2-(3H-1,2,3-triazol-4-ylthio)ethoxy]ethane 861886-26-2P, 2-[4-(Pyrimidin-2-ylthio)butylthio]pryrimidine 861886-27-3P, 4-[4-[(1H-1,2,3-Triazol-4-ylthio)methyl]benzylthio]-1H-1,2,3-triazole
(membrane component; heterocyclic monomers and related proton-conductive polymers and (acid group-containing) hybrid inorg.-organic polymers for fuel cell membranes)

IT 98-11-3, Benzenesulfonic acid, properties 121-65-3, 4-Dodecylbenzenesulfonic acid 288-36-8, 1H-1,2,3-Triazole 288-88-0, 1H-1,2,4-Triazole 1571-33-1, Phenylphosphonic acid 2618-96-4, Dibenzenesulfonimide 7664-38-2, Phosphoric acid, properties
(membrane component; heterocyclic monomers and related proton-conductive polymers and (acid group-containing) hybrid inorg.-organic polymers for fuel cell membranes)

IT 824-94-2P, 1-(Chloromethyl)-4-methoxybenzene 6165-76-0P, Propargyl tosylate 70978-37-9P, 1-(Azidomethyl)-4-methoxybenzene 853807-54-2P, 1-(4-Methoxybenzyl)-1H-1,2,3-triazole-4-carboxaldehyde 853807-55-3P, [1-(4-Methoxybenzyl)-1H-1,2,3-triazol-4-yl]methanol
(monomer precursor; heterocyclic monomers and related proton-conductive polymers and (acid group-containing) hybrid inorg.-organic polymers for fuel cell membranes)

IT 105-13-5, 4-Methoxybenzyl alcohol 107-05-1, 3-Chloropropylene 107-18-6, Allyl alcohol, reactions 107-19-7, Propargyl alcohol 372-48-5, 2-Fluoropyridine 1119-51-3, 5-Bromopent-1-ene 1592-20-7, 4-Vinylbenzyl chloride 2100-17-6, 4-Pentenal 13818-38-7, 3-Mercaptopropylmethyldiethoxysilane 14867-28-8, 3-Iodopropyltrimethoxysilane 21807-63-6, [2-[4-(Chloromethyl)phenyl]ethyl]trimethoxysilane 111269-38-6, 3-Dimethylhydrazone-1,1,1-trifluoro-2-propanone
(monomer precursor; heterocyclic monomers and related proton-conductive polymers and (acid group-containing) hybrid inorg.-organic polymers for fuel cell membranes)

IT 861886-31-9P, 3-(4-Vinylbenzylthio)-1H-1,2,4-triazole 861886-32-0P, 5-(Pent-4-enylthio)-1H-1,2,3-triazole 861886-33-1P, 3-(Pent-4-enylthio)-1H-1,2,4-triazole 861886-39-7P, 2-[3-(Trimethoxysilyl)propylthio]pyrimidine
(monomer; heterocyclic monomers and related proton-conductive polymers and (acid group-containing) hybrid inorg.-organic polymers for fuel cell membranes)

IT 66348-65-0P, 2-(Allylthio)pyrimidine 861886-19-3P, 2-(3-Butenyl)-4-(trifluoromethyl)-1H-imidazole 861886-28-4P, 5-(4-Vinylbenzylthio)-1H-1,2,3-triazole 861886-29-5P, 2-(4-Vinylbenzylthio)pyrimidine 861886-34-2P, 4-(Allyloxy)-1H-1,2,3-triazole 861886-35-3P, 1-(4-Methoxybenzyl)-4-vinyl-1H-1,2,3-triazole 861886-36-4P, 5-[4-[2-(Trimethoxysilyl)ethyl]benzylthio]-1H-1,2,3-triazole 861886-37-5P, 3-[4-[2-(Trimethoxysilyl)ethyl]benzylthio]-1H-1,2,4-triazole 861886-38-6P, 4-[[3-[Diethoxy(methyl)silyl]propylthio]methyl]-2-fluoropyridine 861886-41-1P
(monomer; heterocyclic monomers and related proton-conductive polymers and (acid group-containing) hybrid inorg.-organic polymers for fuel cell membranes)

IT 623-25-6, 1,4-Bis(chloromethyl)benzene 628-21-7, 1,4-Diodobutane 1450-85-7, 2-Mercaptopyrimidine 3179-31-5, 3-Mercapto-1H-1,2,4-triazole 24772-63-2, 1,8-Diiodooctane 36839-55-1, 1,2-Bis(2-iodoethoxy)ethane 39751-89-8, 3-Mercapto-1H-1,2,4-triazole potassium salt 59032-27-8, 5-Mercapto-1H-1,2,3-triazole sodium salt
(precursor; heterocyclic monomers and related proton-conductive polymers and (acid group-containing) hybrid inorg.-organic polymers for fuel cell membranes)

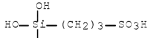
REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 7 OF 14 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2005:364324 HCAPLUS Full-text
DOCUMENT NUMBER: 143:156188
TITLE: Proton conducting organic-inorganic nanocomposite membranes from MPTS and GPTS
AUTHOR(S): Park, Yong-il; Moon, Jooho; Kim, Hye Kyung
CORPORATE SOURCE: School of Materials and System Engineering, Kumoh National Institute of Technology, Kyungbuk, 730-701, S. Korea
SOURCE: Electrochemical and Solid-State Letters (2005), 8(4), A191-A194
CODEN: ESLEF6; ISSN: 1099-0062
PUBLISHER: Electrochemical Society
DOCUMENT TYPE: Journal

LANGUAGE: English
ED Entered STN: 28 Apr 2005
AB Novel fast proton-conducting organic-inorg. nanocomposite membranes were successfully fabricated. The polymer matrix obtained through proper oxidation of thiol ligands in (3-mercaptopropyl)trimethoxysilane (MPTS) and hydrolysis/condensation reaction of (3-glycidoxypropyl)trimethoxysilane (GPTS) showed relatively high proton conductivity over 10-2 S/cm at 25 °C. The proton conductivities of the fabricated composite membranes increased up to 3.6 + 10-1 S/cm by increasing temperature and relative humidity to 70 °C and 100% relative humidity. The high proton conductivity of the composites is due to the proton conducting path through the GPTS-derived pseudo-polyethylene oxide network in which sulfonic acid ligand work as proton donor.
IT 860308-87-8P
(composite with H 020A090C PTFE membrane; proton conducting organic-inorg. nanocomposite membranes from MPTS and GPTS)
RN 860308-87-8 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)-, polymer with trimethoxy[3-(oxiranylmethoxy)propyl]silane (9CI) (CA INDEX NAME)

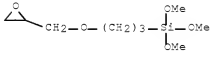
CM 1

CRN 70942-24-4
CMF C3 H10 O6 S Si

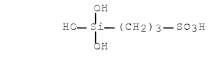


CM 2

CRN 2530-83-8
CMF C9 H20 O5 Si



IT 70942-24-4P, 3-(Trihydroxysilyl)-1-propanesulfonic acid
(proton conducting organic-inorg. nanocomposite membranes from MPTS and GPTS)
RN 70942-24-4 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 35, 36, 38, 76
ST proton cond polyoxyalkylene siloxane sulfonic acid nanocomposite membrane
IT Polyelectrolytes
(composite with hydrophilic PTFE membrane; proton conducting organic-inorg. nanocomposite membranes from MPTS and GPTS)
IT Humidity
(effect on conductivity; proton conducting organic-inorg. nanocomposite membranes from MPTS and GPTS)
IT Membranes, nonbiological
(elec. conductive; proton conducting organic-inorg. nanocomposite membranes from MPTS and GPTS)
IT Electric conductivity
(of composite membranes; proton conducting organic-inorg. nanocomposite membranes from MPTS and GPTS)
IT Oxidation
(of thiol group; proton conducting organic-inorg. nanocomposite membranes from MPTS and GPTS)
IT Hydrolysis
(partial, of trimethoxy group; proton conducting organic-inorg. nanocomposite membranes from MPTS and GPTS)
IT Polysiloxanes, preparation
(polyoxyalkylene-, sulfo- containing; proton conducting organic-inorg. nanocomposite membranes from MPTS and GPTS)
IT Polyoxyalkylenes, preparation
(polysiloxane-, sulfo- containing; proton conducting organic-inorg. nanocomposite membranes from MPTS and GPTS)
IT Nanocomposites
(proton conducting organic-inorg. nanocomposite membranes from MPTS and GPTS)
IT Ionic conductivity
(proton; proton conducting organic-inorg. nanocomposite membranes from MPTS and GPTS)
IT 860308-87-8P
(composite with H 020A090C PTFE membrane; proton conducting organic-inorg. nanocomposite membranes from MPTS and GPTS)
IT 860479-46-5, H 020A090C
(composite with sulfo-silylated PEO adducts; proton conducting organic-inorg. nanocomposite membranes from MPTS and GPTS)
IT 163294-14-2, Nafion 112
(proton conducting organic-inorg. nanocomposite membranes from MPTS and GPTS)
IT 2530-83-8, (3-Glycidoxypropyl)trimethoxysilane 4420-74-0, (3-Mercaptopropyl)trimethoxysilane
(proton conducting organic-inorg. nanocomposite membranes from MPTS and GPTS)

IT 70942-24-4P, 3-(Trihydroxysilyl)-1-propanesulfonic acid
(proton conducting organic-inorg. nanocomposite membranes from MPTS and GPTS)
IT 7722-84-1, Hydrogen peroxide, reactions
(proton conducting organic-inorg. nanocomposite membranes from MPTS and GPTS)
REFERENCE COUNT: 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 8 OF 14 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2004:1059699 HCAPLUS Full-text
DOCUMENT NUMBER: 142:41500
TITLE: Polymer electrolyte membranes based on imidazole ring terminated flexible branches grafted on hybrid inorganic-organic polymers
INVENTOR(S): Li, Siwen; Lui, Meilin; Sun, Qunhui; Li, Wen
PATENT ASSIGNEE(S): Toyota Technical Center USA, Inc., USA; Georgia Tech Research Corporation
SOURCE: PCT Int. Appl., 52 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004107477	A2	20041209	WO 2004-US16897	20040528
WO 2004107477	A3	20050210		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CN 1809606	A	20060726	CN 2004-80017622	20040528
JP 2007504637	T	20070301	JP 2006-533487	20040528
DE 112004000920	T5	20080313	DE 2004-112004000920	20040528
US 20070099035	A1	20070503	US 2006-558521	20061218
PRIORITY APPLN. INFO.:			US 2003-473957P P	20030528
			WO 2004-US16897 W	20040528

ED Entered STN: 10 Dec 2004
AB A composition of matter comprises a polymer network, including silicon atoms and oxygen atoms, a first organic side-chain attached to at least some silicon atoms within the polymer network comprising a flexible linking group and a terminal group, the terminal group including at least one atom providing a lone pair of electrons. The composition of matter can be used to form a proton-conducting membrane. In illustrative examples, the polymer network can be an organic-inorg. hybrid network and the terminal group can includes a nitrogen-containing heterocycle.
IT 805244-23-9P

(polymer electrolyte membranes based on imidazole ring terminated flexible branches grafted on hybrid inorg.-organic graft polymers)

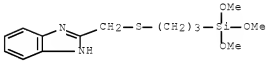
RN 805244-23-9 HCAPLUS

CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)-, polymer with α-[3-(dimethoxymethylsilyl)propyl]-ω-[3-(dimethoxymethylsilyl)propoxy]poly[oxy(methyl-1,2-ethanediyl)], 4,4,13,13-tetraethoxy-3,14-dioxa-4,13-disilahexadecane and 2-[[[3-(trimethoxysilyl)propyl]thio]methyl]-1H-benzimidazole (9CI) (CA INDEX NAME)

CM 1

CRN 805244-09-1

CMF C14 H22 N2 O3 S Si

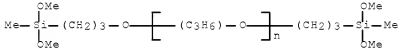


CM 2

CRN 75009-88-0

CMF (C3 H6 O)n C12 H30 O5 Si2

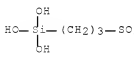
CCI IDS, PMS



CM 3

CRN 70942-24-4

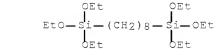
CMF C3 H10 O6 S Si



CM 4

CRN 52217-60-4

CMF C20 H46 O6 Si2



IC ICM H01M
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
IT Fuel cells
(proton exchange membrane; polymer electrolyte membranes based on imidazole ring terminated flexible branches grafted on hybrid inorg.-organic polymers)
IT Ionic conductivity
(proton; polymer electrolyte membranes based on imidazole ring terminated flexible branches grafted on hybrid inorg.-organic polymers)
IT 805244-20-6P 805244-22-8P 805244-23-9P
(polymer electrolyte membranes based on imidazole ring terminated flexible branches grafted on hybrid inorg.-organic graft polymers)
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 9 OF 14 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2004:842780 HCAPLUS Full-text
DOCUMENT NUMBER: 141:352712
TITLE: Organic-inorganic hybrid type proton-conductive membrane and fuel cells
INVENTOR(S): Wariishi, Koji; Ono, Michio
PATENT ASSIGNEE(S): Fuji Photo Film Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 25 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004288582	A	20041014	JP 2003-82371	20030325
US 20040248013	A1	20041209	US 2004-806258	20040322
PRIORITY APPLN. INFO.:			JP 2003-82371 A	20030325

ED Entered STN: 15 Oct 2004
AB The disclosed proton-conductive material is prepare by sol-gel hydrolysis-condensation polymerization of a compound having an alkoxysilyl groups and polymerizable functional group with a compound having a proton doner group or its precursor group. Proton- conductive membranes and direct methanol type fuel cells prepared by using the proton conductors are also disclosed. The membranes exhibit high proton conductivity, no leaching loss of the proton conductor, good flexibility, and low methanol permeability.
IT 775304-81-9P 775304-82-0P 775304-84-2P
775304-86-4P 775304-87-5P 775304-88-6P

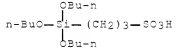
(preparation as proton conductive membranes
for direct methanol fuel cells)

RN 775304-81-9 HCAPLUS

CN 1-Propanesulfonic acid, 3-(tributoxysilyl)-, polymer with trimethoxy[3-(oxiranylmethoxy)propyl]silane (9CI) (CA INDEX NAME)

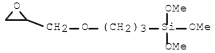
CM 1

CRN 765279-29-6
CMF C15 H34 O6 S Si



CM 2

CRN 2530-83-8
CMF C9 H20 O5 Si

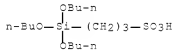


RN 775304-82-0 HCAPLUS

CN 1-Propanesulfonic acid, 3-(tributoxysilyl)-, polymer with triethoxy[3-[(3-ethyl-3-oxetanyl)methoxy]propyl]silane (9CI) (CA INDEX NAME)

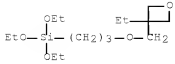
CM 1

CRN 765279-29-6
CMF C15 H34 O6 S Si



CM 2

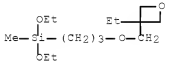
CRN 220520-33-2
CMF C15 H32 O5 Si



RN 775304-84-2 HCAPLUS
CN 1-Propanesulfonic acid, 3-(tributoxysilyl)-, polymer with diethoxy[3-[(3-ethyl-3-oxetanyl)methoxy]propyl]methylsilane and triethoxy[3-[(3-ethyl-3-oxetanyl)methoxy]propyl]silane (9CI) (CA INDEX NAME)

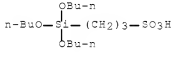
CM 1

CRN 775304-83-1
CMF C14 H30 O4 Si



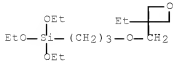
CM 2

CRN 765279-29-6
CMF C15 H34 O6 S Si



CM 3

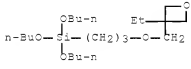
CRN 220520-33-2
CMF C15 H32 O5 Si



RN 775304-86-4 HCAPLUS
CN 1-Propanesulfonic acid, 3-(tributoxysilyl)-, polymer with tributoxy[3-[(3-ethyl-3-oxetanyl)methoxy]propyl]silane (9CI) (CA INDEX NAME)

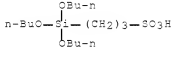
CM 1

CRN 775304-85-3
CMF C21 H44 O5 Si



CM 2

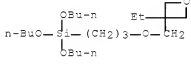
CRN 765279-29-6
CMF C15 H34 O6 S Si



RN 775304-87-5 HCAPLUS
CN Methanesulfonic acid, (tributoxysilyl)-, polymer with tributoxy[3-[(3-ethyl-3-oxetanyl)methoxy]propyl]silane (9CI) (CA INDEX NAME)

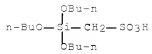
CM 1

CRN 775304-85-3
CMF C21 H44 O5 Si



CM 2

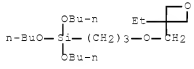
CRN 765279-30-9
CMF C13 H30 O6 S Si



RN 775304-88-6 HCAPLUS
CN 1-Propanesulfonic acid, 3-(dibutoxymethylsilyl)-, polymer with tributoxy[3-[(3-ethyl-3-oxetanyl)methoxy]propyl]silane and 3-(tributoxysilyl)-1-propanesulfonic acid (9CI) (CA INDEX NAME)

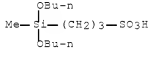
CM 1

CRN 775304-85-3
CMF C21 H44 O5 Si



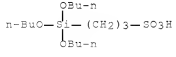
CM 2

CRN 765279-32-1
CMF C12 H28 O5 S Si



CM 3

CRN 765279-29-6
CMF C15 H34 O6 S Si



IC ICM H01B001-06
ICS C08G077-06; H01M008-02; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST polysiloxane proton conductor membrane
direct methanol fuel cell
IT Fuel cells
(direct methanol; preparation of polysiloxane type proton conductive membranes for)
IT Silsesquioxanes
(polysiloxane-; preparation as proton conductive membranes for direct methanol fuel cells)
IT Polysiloxanes, uses
Silsesquioxanes
(preparation as proton conductive membranes for direct methanol fuel cells)
IT Membranes, nonbiological
(proton-conductive; preparation of polysiloxanes and silsesquioxanes as)
IT Polysiloxanes, uses
(silsesquioxane-; preparation as proton conductive membranes for direct methanol fuel cells)
IT 775304-81-9P 775304-82-0P 775304-84-2P
775304-86-4P 775304-87-5P 775304-88-6P
(preparation as proton conductive membranes for direct methanol fuel cells)

L32 ANSWER 10 OF 14 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2004:796486 HCAPLUS Full-text
DOCUMENT NUMBER: 141:317191
TITLE: Silica sol composition, membrane electrode assembly with proton-exchange membrane, and fuel cell
PATENT ASSIGNEE(S): Fuji Photo Film Co. Ltd., Japan
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CODEN: EPXXDW
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
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JP 2004307814	A	20041104	JP 2003-432663	20031226
US 20040241522	A1	20041202	US 2004-807689	20040324
US 7371480	B2	20080513		
PRIORITY APPLN. INFO.:			JP 2003-82369 A	20030325
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			JP 2003-432663 A	20031226

ED Entered STN: 30 Sep 2004
AB Provided are a proton-exchange membrane of which the ionic conductivity is high and the methanol crossover is low, and a fuel cell of high power that comprises the proton-exchange membrane. The proton-exchange membrane has a structure of mesogen-containing organic mol. chains and a proton-donating

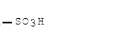
group-containing group covalent-bonding to a silicon-oxygen three-dimensional crosslinked matrix, in which at least a part of the organic mol. chains are oriented to form an aggregate thereof; and the fuel cell comprises the membrane.

IT 42169-84-6P 62896-03-1P 765279-29-6P
765279-30-9P 765279-61-6P 765279-63-8P
765279-65-0P
(silica sol composition, membrane electrode assembly with proton-exchange membrane, and fuel cell)

RN 42169-84-6 HCAPLUS
CN 1-Propanethiol, 3-(tributoxysilyl)- (CA INDEX NAME)

RN 62896-03-1 HCAPLUS
CN Methanethiol, 1-(tributoxysilyl)- (CA INDEX NAME)

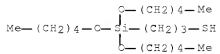
RN 765279-29-6 HCAPLUS
CN 1-Propanesulfonic acid, 3-(tributoxysilyl)- (CA INDEX NAME)



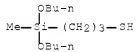
RN 765279-30-9 HCAPLUS
CN Methanesulfonic acid, 1-(tributoxysilyl)- (CA INDEX NAME)

RN 765279-61-6 HCAPLUS

CN 1-Propanethiol, 3-[tris(pentyloxy)silyl]- (CA INDEX NAME)



RN 765279-63-8 HCAPLUS
CN 1-Propanethiol, 3-(dibutoxymethylsilyl)- (CA INDEX NAME)



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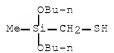
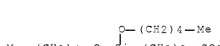
CN Methanethiol, 1-(dibutoxymethylsilyl)- (CA INDEX NAME)



IT 765279-31-0P 765279-32-1P 765279-33-2P
765279-57-0P
(silica sol composition, membrane electrode assembly with proton-exchange membrane, and fuel cell)
RN 765279-31-0 HCAPLUS
CN 1-Propanesulfonic acid, 3-[tris(pentyloxy)silyl]- (CA INDEX NAME)



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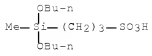
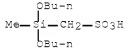
CN 1-Propanesulfonic acid, 3-(dibutoxymethylsilyl)- (CA INDEX NAME)



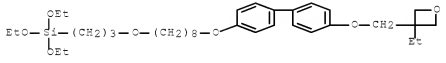
RN 765279-33-2 HCAPLUS
CN Methanesulfonic acid, 1-(dibutoxymethylsilyl)- (CA INDEX NAME)



RN 765279-57-0 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)-, polymer with triethoxy[3-[[8-[[4'-[(3-ethyl-3-oxetanyl)methoxy][1,1'-biphenyl]-4-yl]oxy]octyl]oxy]propyl]silane (9CI) (CA INDEX NAME)

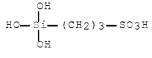
CM 1

CRN 676166-84-0
CMF C35 H56 O7 Si



CM 2

CRN 70942-24-4
CMF C3 H10 O6 S Si



IT 765279-37-6P 765279-38-7P 765279-39-8P
765279-40-1P 765279-41-2P 765279-42-3P
765279-43-4P 765279-45-6P 765279-47-8P
765279-50-3P 765279-53-6P 765279-55-8P
(silica sol composition, membrane electrode

assembly with proton-exchange membrane, and fuel cell)

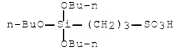
RN 765279-37-6 HCAPLUS

CN 1-Propanesulfonic acid, 3-(tributoxysilyl)-, polymer with triethoxy[3-[[8-[[4'-[(3-ethyl-3-oxetanyl)methoxy][1,1'-biphenyl]-4-yl]oxy]octyl]oxy]propyl]silane (9CI) (CA INDEX NAME)

CM 1

CRN 765279-29-6

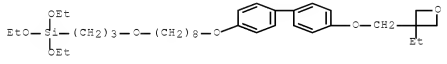
CMF C15 H34 O6 S Si



CM 2

CRN 676166-84-0

CMF C35 H56 O7 Si



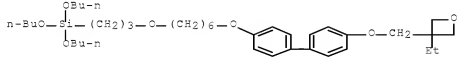
RN 765279-38-7 HCAPLUS

CN Methanesulfonic acid, (tributoxysilyl)-, polymer with tributoxy[3-[[6-[[4'-[(3-ethyl-3-oxetanyl)methoxy][1,1'-biphenyl]-4-yl]oxy]hexyl]oxy]propyl]silane (9CI) (CA INDEX NAME)

CM 1

CRN 765279-35-4

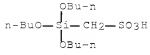
CMF C39 H64 O7 Si



CM 2

CRN 765279-30-9

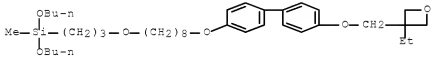
CMF C13 H30 O6 S Si



RN 765279-39-8 HCAPLUS
CN Methanesulfonic acid, (tributoxysilyl)-, polymer with dibutoxy[3-[[8-[[4'-[(3-ethyl-3-oxetanyl)methoxy][1,1'-biphenyl]-4-yl]oxy]octyl]oxy]propyl]methylsilane and tributoxy[3-[[6-[[4'-[(3-ethyl-3-oxetanyl)methoxy][1,1'-biphenyl]-4-yl]oxy]hexyl]oxy]propyl]silane (9CI) (CA INDEX NAME)

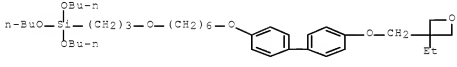
CM 1

CRN 765279-36-5
CMF C38 H62 O6 Si



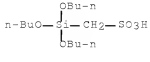
CM 2

CRN 765279-35-4
CMF C39 H64 O7 Si



CM 3

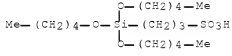
CRN 765279-30-9
CMF C13 H30 O6 S Si



RN 765279-40-1 HCAPLUS
CN 1-Propanesulfonic acid, 3-(tributoxysilyl)-, polymer with triethoxy[3-[[8-[[4'-[(3-ethyl-3-oxetanyl)methoxy][1,1'-biphenyl]-4-yl]oxy]octyl]oxy]propyl]silane and 3-[tris(pentyloxy)silyl]-1-propanesulfonic acid (9CI) (CA INDEX NAME)

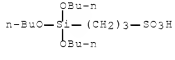
CM 1

CRN 765279-31-0
CMF C18 H40 O6 S Si



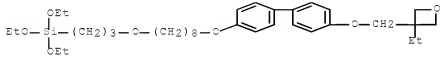
CM 2

CRN 765279-29-6
CMF C15 H34 O6 S Si



CM 3

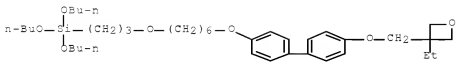
CRN 676166-84-0
CMF C35 H56 O7 Si



RN 765279-41-2 HCAPLUS
CN 1-Propanesulfonic acid, 3-[tris(pentyloxy)silyl]-, polymer with tributoxy[3-[[6-[[4'-[(3-ethyl-3-oxetanyl)methoxy][1,1'-biphenyl]-4-yl]oxy]hexyl]oxy]propyl]silane (9CI) (CA INDEX NAME)

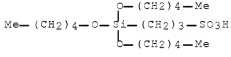
CM 1

CRN 765279-35-4
CMF C39 H64 O7 Si



CM 2

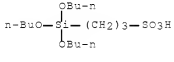
CRN 765279-31-0
CMF C18 H40 O6 S Si



RN 765279-42-3 HCAPLUS
CN Benzoic acid, 4-[[8-[(3-ethyl-3-oxetanyl)methoxy]octyl]oxy]-, 4'-[3-(triethoxysilyl)propoxy][1,1'-biphenyl]-4-yl ester, polymer with 3-(tributoxysilyl)-1-propanesulfonic acid (9CI) (CA INDEX NAME)

CM 1

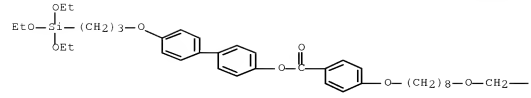
CRN 765279-29-6
CMF C15 H34 O6 S Si



CM 2

CRN 676166-80-6
CMF C42 H60 O9 Si

PAGE 1-A

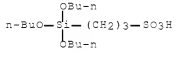


PAGE 1-B

RN 765279-43-4 HCAPLUS
CN 1-Propanesulfonic acid, 3-(tributoxysilyl)-, polymer with 2-methyl-2-[[[8-[[4'-[(3-methyl-3-oxetanyl)methoxy][1,1'-biphenyl]-4-yl]oxy]octyl]oxy]methyl]-1,3-propanediol and triethoxy[3-[[8-[[6-[(3-ethyl-3-oxetanyl)methoxy]-2-naphthalenyl]oxy]octyl]oxy]propyl]silane (9CI) (CA INDEX NAME)

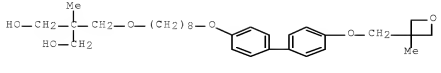
CM 1

CRN 765279-29-6
CMF C15 H34 O6 S Si



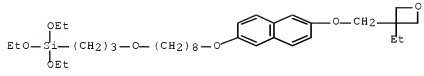
CM 2

CRN 676166-91-9
CMF C30 H44 O6



CM 3

CRN 676166-79-3
CMF C33 H54 O7 Si

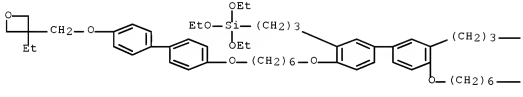


RN 765279-45-6 HCAPLUS
CN 1-Propanesulfonic acid, 3-(tributoxysilyl)-, polymer with 3,3'-[[3,3'-bis[3-(triethoxysilyl)propyl][1,1'-biphenyl]-4,4'-diyl]bis(oxy-6,1-hexanediyloxy[1,1'-biphenyl]-4',4-diyloxymethylene)]bis[3-ethyloxetane] (9CI) (CA INDEX NAME)

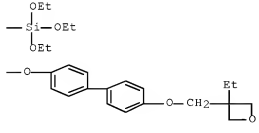
CM 1

CRN 765279-44-5
CMF C78 H110 O14 Si2

PAGE 1-A

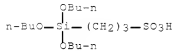


PAGE 1-B



CM 2

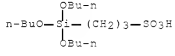
CRN 765279-29-6
CMF C15 H34 O6 S Si



RN 765279-47-8 HCAPLUS
CN 1-Propanesulfonic acid, 3-(tributoxysilyl)-, polymer with 2-methyl-2-[[[8-[[4'-[(3-methyl-3-oxetanyl)methoxy][1,1'-biphenyl]-4-yl]oxy]octyl]oxy]methyl]-1,3-propanediol and triethoxy[3-[[8-[[4'-[(3-ethyl-3-oxetanyl)methoxy][1,1'-biphenyl]-4-yl]oxy]octyl]oxy]propyl]silane (9CI) (CA INDEX NAME)

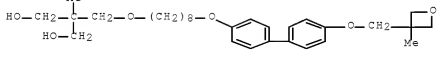
CM 1

CRN 765279-29-6
CMF C15 H34 O6 S Si



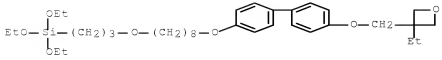
CM 2

CRN 676166-91-9
CMF C30 H44 O6



CM 3

CRN 676166-84-0
CMF C35 H56 O7 Si



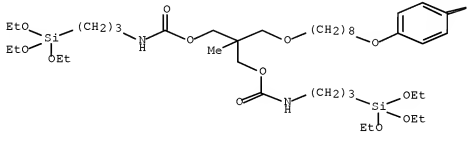
RN 765279-50-3 HCAPLUS
CN 1-Propanesulfonic acid, 3-(tributoxysilyl)-, polymer with 2-methyl-2-[[[8-[[4'-[(3-methyl-3-oxetanyl)methoxy][1,1'-biphenyl]-4-yl]oxy]octyl]oxy]methyl]-1,3-propanediol and 2-methyl-2-[[[8-[4-(trans-4-pentylcyclohexyl)phenoxy]octyl]oxy]methyl]-1,3-propanediyl bis[[3-(triethoxysilyl)propyl]carbamate] (9CI) (CA INDEX NAME)

CM 1

CRN 765279-49-0
CMF C50 H94 N2 O12 Si2

Relative stereochemistry.

PAGE 1-A



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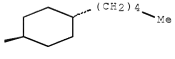

CM 2

CRN 765279-29-6
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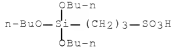

CM 3

CRN 676166-91-9
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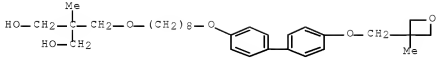
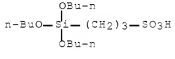


RN 765279-53-6 HCAPLUS
CN Benzoic acid, 4-[[8-[(3-ethyl-3-oxetanyl)methoxy]octyl]oxy]-, 4'-(2-propenyloxy)[1,1'-biphenyl]-4-yl ester, polymer with 3-(tributoxysilyl)-1-propanesulfonic acid and 4'-[3-(triethoxysilyl)propoxy][1,1'-biphenyl]-4-yl 4-[[8-[(3-ethyl-3-oxetanyl)methoxy]octyl]oxy]benzoate (9CI) (CA INDEX NAME)

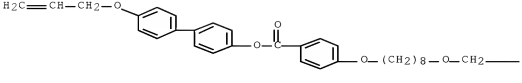
CM 1

CRN 765279-29-6
CMF C15 H34 O6 S Si



CM 2

CRN 676166-82-8
CMF C36 H44 O6



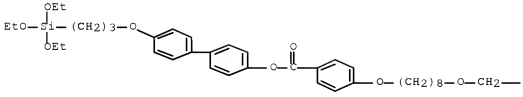
PAGE 1-A

PAGE 1-B

CM 3

CRN 676166-80-6
CMF C42 H60 O9 Si

PAGE 1-A



PAGE 1-B

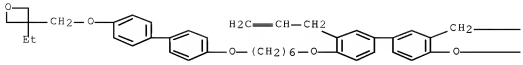
RN 765279-55-8 HCAPLUS
CN 1-Propanesulfonic acid, 3-(tributoxysilyl)-, polymer with 3,3'-[[3,3'-bis[3-(triethoxysilyl)propyl][1,1'-biphenyl]-4,4'-diyl]bis(oxy-6,1-hexanediyloxy[1,1'-biphenyl]-4',4-diyloxymethylene)]bis[3-ethyloxetane] and 3,3'-[(3,3'-di-2-propenyl[1,1'-biphenyl]-4,4'-diyl)bis(oxy-6,1-hexanediyloxy[1,1'-biphenyl]-4',4-diyloxymethylene)]bis[3-ethyloxetane] (9CI) (CA INDEX NAME)

CM 1

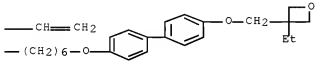
CRN 765279-46-7

CMF C66 H78 O8

PAGE 1-A



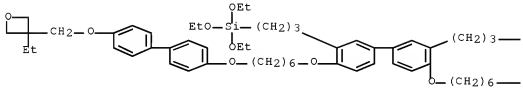
PAGE 1-B



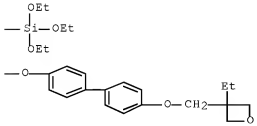
CM 2

CRN 765279-44-5
CMF C78 H110 O14 Si2

PAGE 1-A

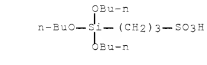


PAGE 1-B



CM 3

CRN 765279-29-6
CMF C15 H34 O6 S Si



IC ICM H01M008-10
ICS C08J005-22; H01B001-12; C08G077-00; C07F007-08
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST fuel cell silica sol compn; membrane electrode assembly fuel cell
IT Fuel cells
(proton exchange membrane; silica sol composition, membrane electrode assembly with proton-exchange membrane, and fuel cell)
IT Membranes, nonbiological
(proton exchange; silica sol composition, membrane electrode assembly with proton-exchange membrane, and fuel cell)
IT Carbon black, uses
(silica sol composition, membrane electrode assembly with proton-exchange membrane, and fuel cell)
IT Silica gel, preparation
(silica sol composition, membrane electrode assembly with proton-exchange membrane, and fuel cell)
IT 676166-82-8 676166-91-9 765279-46-7
(plasticizer; silica sol composition, membrane electrode assembly with proton-exchange membrane, and fuel cell)
IT 7440-06-4, Platinum, uses
(silica sol composition, membrane electrode assembly with proton-exchange membrane, and fuel cell)
IT 7722-84-1, Hydrogen peroxide, processes
(silica sol composition, membrane electrode assembly with proton-exchange membrane, and fuel cell)
IT 42169-82-4P 42169-84-6P 62896-03-1P
765279-29-6P 765279-30-9P 765279-35-4P
765279-61-6P 765279-63-8P 765279-65-0P
765279-67-2P 765279-70-7P
(silica sol composition, membrane electrode assembly with proton-exchange membrane, and fuel cell)
IT 765279-31-0P 765279-32-1P 765279-33-2P
765279-34-3P 765279-36-5P 765279-44-5P 765279-57-0P
(silica sol composition, membrane electrode assembly with proton-exchange membrane, and fuel cell)
IT 765279-37-6P 765279-38-7P 765279-39-8P
765279-40-1P 765279-41-2P 765279-42-3P

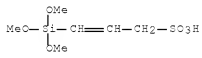
765279-43-4P 765279-45-6P 765279-47-8P
765279-50-3P 765279-53-6P 765279-55-8P
(silica sol composition, membrane electrode assembly with proton-exchange membrane, and fuel cell)
IT 92-88-6, [1,1'-Biphenyl]-4,4'-diol 106-95-6, Allyl bromide, reactions 120-47-8 556-56-9, Allyl iodide 581-43-1, 2,6-Naphthalenediol 998-30-1, Triethoxysilane 3047-32-3 4549-32-0 7766-50-9 52189-89-6 82575-69-7 181134-88-3
(silica sol composition, membrane electrode assembly with proton-exchange membrane, and fuel cell)
IT 97344-30-4P 123640-26-6P 347397-97-1P 676166-74-8P 676166-77-1P 676166-78-2P 676166-81-7P 676166-83-9P 676166-85-1P 765279-49-0P 765279-76-3P 765279-81-0P 765279-88-7P 765279-93-4P 765279-96-7P
(silica sol composition, membrane electrode assembly with proton-exchange membrane, and fuel cell)
IT 676166-67-9P 676166-73-7P 676166-79-3P 676166-80-6P 676166-84-0P
(silica sol composition, membrane electrode assembly with proton-exchange membrane, and fuel cell)

L32 ANSWER 11 OF 14 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2003:476007 HCAPLUS Full-text
DOCUMENT NUMBER: 139:351258
TITLE: Proton conducting inorganic-organic matrices based on sulfonyl- and styrene derivatives functionalized polycondensates via sol-gel processing
AUTHOR(S): Jacob, Stephane; Cochet, Sebastien; Poinsignon, Christiane; Popall, Michael
CORPORATE SOURCE: Fraunhofer Institut fur Silicatforschung, Wurzburg, D-97082, Germany
SOURCE: Electrochimica Acta (2003), 48(14-16), 2181-2186
CODEN: ELCAAV; ISSN: 0013-4686
PUBLISHER: Elsevier Science Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 23 Jun 2003
AB Proton conducting inorg.-organic hybrid polymer electrolytes were developed based on sulfonated styrene alkoxysilanes. The sulfonyl-styrene alkoxysilanes were synthesized via modified Grignard reaction of bromostyrene, Mg, methyltriethoxysilane or methyltrimethoxysilane in di-Et ether followed by hydrolysis and condensation of this intermediate with N-(3-triethoxysilylpropyl)-4,5-dihydroimidazole, 3-aminopropyltriethoxysilane. After evaporation of the solvent, the resin was cast in Teflon molds or applied on a substrate as a film and, finally, organically crosslinked via UV and/or thermal curing. The role of composition on conductivity and mech. properties of the hybrid nanocomposites was studied. The conductivity of 3 + 10-3 S cm-1 at room temperature was measured for membranes free of water, whose precursor composition consists of 60% sulfonated alkoxysilane, mixed with 2 mol imidazole per mol -SO3H. If the imidazole is exchanged by water (maximum 15% uptake), the membranes show conductivity up to 8 + 10-3 S cm-1 at room temperature The inorg.-organic matrix was stable up to 180° (<5% weight loss), as measured by TGA. The proton conducting membrane hybrid electrolytes are of interest for use in fuel cells.
IT 210160-21-7P

(monomer; preparation and mech. properties and proton conductivity of hybrid electrolyte membranes of sulfonyl-styrene-alkoxysilane-imidazole or -amine via sol-gel processing)

RN 210160-21-7 HCAPLUS

CN 2-Propene-1-sulfonic acid, 3-(trimethoxysilyl)- (CA INDEX NAME)



CC 37-5 (Plastics Manufacture and Processing)
Section cross-reference(s): 52, 57, 72, 76

ST sulfonated styrene alkoxysilane sol gel processing curing conducting hybrid; proton conducting hybrid electrolyte prepn modified Grignard reaction; thermal stability cured proton conducting hybrid electrolyte membrane

IT Membranes, nonbiological
(hybrid, electrolytes; preparation and mech. properties and proton conductivity of hybrid electrolyte membranes of sulfonyl-styrene-alkoxysilane-imidazole or -amine via sol-gel processing)

IT Crosslinking
(photochem.; preparation and mech. properties and proton conductivity of hybrid electrolyte membranes of sulfonyl-styrene-alkoxysilane-imidazole or -amine via sol-gel processing)

IT Sol-gel processing
(polymerization; preparation and mech. properties and proton conductivity of hybrid electrolyte membranes of sulfonyl-styrene-alkoxysilane-imidazole or -amine via sol-gel processing)

IT Ceramers
Grignard reaction
Hybrid organic-inorganic materials
Nanocomposites
Polymer electrolytes
Sulfonation
Young's modulus
(preparation and mech. properties and proton conductivity of hybrid electrolyte membranes of sulfonyl-styrene-alkoxysilane-imidazole or -amine via sol-gel processing)

IT Ionic conductivity
(proton; preparation and mech. properties and proton conductivity of hybrid electrolyte membranes of sulfonyl-styrene-alkoxysilane-imidazole or -amine via sol-gel processing)

IT Polymerization
(sol-gel; preparation and mech. properties and proton conductivity of hybrid electrolyte membranes of sulfonyl-styrene-alkoxysilane-imidazole or -amine via sol-gel processing)

IT Crosslinking
(thermal; preparation and mech. properties and proton

conductivity of hybrid electrolyte membranes of sulfonyl-styrene-alkoxysilane-imidazole or -amine via sol-gel processing)

IT 84434-11-7, Lucirin TPO-L 119313-12-1, Irgacure 369
(curing photoinitiator; preparation and mech. properties and proton conductivity of hybrid electrolyte membranes of sulfonyl-styrene-alkoxysilane-imidazole or -amine via sol-gel processing)

IT 210160-21-7P
(monomer; preparation and mech. properties and proton conductivity of hybrid electrolyte membranes of sulfonyl-styrene-alkoxysilane-imidazole or -amine via sol-gel processing)

IT 919-30-2DP, 3-Aminopropyltriethoxysilane, polymers with sulfonyl-alkoxysilanes and styrene-alkoxysilanes 5990-80-7DP, polymers with sulfonyl-alkoxysilanes and silylimidazoles and sulfonamides 58068-97-6DP, N-(3-Triethoxysilylpropyl)-4,5-dihydroimidazole, polymers with sulfonyl-alkoxysilanes and styrene-alkoxysilanes
(preparation and mech. properties and proton conductivity of hybrid electrolyte membranes of sulfonyl-styrene-alkoxysilane-imidazole or -amine via sol-gel processing)

IT 1185-55-3, Methyltrimethoxysilane 1335-06-4, Bromostyrene 2031-67-6, Methyltriethoxysilane 2551-83-9, Allyltrimethoxysilane 7439-95-4, Magnesium, reactions 7446-11-9, Sulfur trioxide, reactions
(preparation and mech. properties and proton conductivity of hybrid electrolyte membranes of sulfonyl-styrene-alkoxysilane-imidazole or -amine via sol-gel processing)

IT 5990-80-7P, p-Vinylphenylmethyldiethoxysilane
(preparation and mech. properties and proton conductivity of hybrid electrolyte membranes of sulfonyl-styrene-alkoxysilane-imidazole or -amine via sol-gel processing)

IT 7732-18-5, Water, processes
(uptake by membrane; preparation and mech. properties and proton conductivity of hybrid electrolyte membranes of sulfonyl-styrene-alkoxysilane-imidazole or -amine via sol-gel processing)

REFERENCE COUNT: 15 THERE ARE 15 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 12 OF 14 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2003:377173 HCAPLUS Full-text

DOCUMENT NUMBER: 138:371759

TITLE: Proton conductive membrane, its manufacture, and fuel cell using the membrane

INVENTOR(S): Nomura, Shigeki; Sugimoto, Toshiya; Nakamura, Masanori; Yamauti, Kenji

PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan

SOURCE: PCT Int. Appl., 120 pp.
CODEN: PIXXD2

DOCUMENT TYPE: Patent

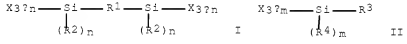
LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003041091	A1	20030515	WO 2002-JP11242	20021029
W: CA, CN, JP, KR, US				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR				
CA 2433320	A1	20030515	CA 2002-2433320	20021029
EP 1441365	A1	20040728	EP 2002-802706	20021029
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR, BG, CZ, EE, SK				
JP 3679104	B2	20050803	JP 2003-543039	20021029
CN 1230832	C	20051207	CN 2002-803316	20021029
US 20040062970	A1	20040401	US 2003-450845	20031021
US 7214756	B2	20070508		
HK 1063528	A1	20060317	HK 2004-106177	20040818
US 20070213495	A1	20070913	US 2007-727036	20070323
PRIORITY APPLN. INFO.:			JP 2001-332977 A	20011030
			JP 2002-29781 A	20020206
			JP 2002-109493 A	20020411
			WO 2002-JP11242 W	20021029
			US 2003-450845 A3	20031021

OTHER SOURCE(S): MARPAT 138:371759
ED Entered STN: 16 May 2003
GI

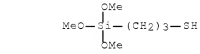


AB The membrane contains a C-containing organic-inorg. structure, crosslinked by Si-O units by covalent bonds, and an acid group cong. structure crosslinked by Si-O units by covalent bonds. Preferably, the composite structure is I, where X = a crosslinking -O- or OH, R1 = C1-50 side chain, R2 = ME, Et, PR, or Ph, and n = 0, 1, or 2; and the acid group. containing structure is II, where X = a crosslinking -O- or OH, R3 = sided chain containing ≥1 acid group, R4 = Me, Et, Pr, or Ph, and m = 0,1,or 2; and the membrane may also contain glass fibers or ceramic whiskers. The membrane is manufactured by: mixing crosslink-able silyl group containing precursors of the 2 structures, preparing membrane of the mixture, and hydrolyzing and condensate the precursors. The acid group may also be formed, after the condensation, by using precursors having function groups that can be to form acid groups by post-processing.

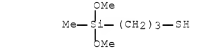
IT 4420-74-0DP, 3-Mercaptopropyltrimethoxysilane, hydrolyzed, condensation products with hydrolyzed silyl compds., oxidized
31001-77-1DP, 3-Mercaptopropylmethyldimethoxysilane, hydrolyzed, condensed, oxidized 70942-24-4DP, hydrolyzed, condensation products with hydrolyzed silyl compds.
161000-64-2DP, X-41-1805, hydrolyzed, condensation products

with hydrolyzed silyl compds., oxidized (compns. and manufacture of proton conductive membranes for fuel cell electrolytes)

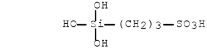
RN 4420-74-0 HCAPLUS
CN 1-Propanethiol, 3-(trimethoxysilyl)- (CA INDEX NAME)



RN 31001-77-1 HCAPLUS
CN 1-Propanethiol, 3-(dimethoxymethylsilyl)- (CA INDEX NAME)



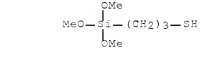
RN 70942-24-4 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (CA INDEX NAME)



RN 161000-64-2 HCAPLUS
CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

CRN 78-10-4
CMF C8 H20 O4 Si

IC ICM H01B001-06
ICS H01M008-02; H01M008-10; C08J005-22; C08G077-50
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST fuel cell proton conductive silicon contg polymer membrane manuf
IT Glass fibers, uses
(compns. and manufacture of proton conductive membranes containing glass whiskers and glass fibers for fuel cell electrolytes)
IT Electric conductors
Fuel cell electrolytes
(compns. and manufacture of proton conductive membranes for fuel cell electrolytes)
IT Polysiloxanes, uses
(di-Me, di-Ph, hydroxy-terminated, hydrolyzed, condensation products with hydrolyzed silyl compds.; compns. and manufacture of proton conductive membranes for fuel cell electrolytes)
IT Polysiloxanes, uses
(mercapto, hydrolyzed, condensation products with hydrolyzed silyl compds., oxidized; compns. and manufacture of proton conductive membranes for fuel cell electrolytes)
IT 12056-51-8, Potassium titanium oxide (K2Ti6O13) 12400-04-3, Aluminum borate oxide (Al2(BO2)4O)
(compns. and manufacture of proton conductive membranes containing glass whiskers and glass fibers for fuel cell electrolytes)
IT 4420-74-0DP, 3-Mercaptopropyltrimethoxysilane, hydrolyzed, condensation products with hydrolyzed silyl compds., oxidized 4420-74-0DP, 3-Mercaptopropyltrimethoxysilane, hydrolyzed, condensed, oxidized 7631-90-5DP, Sodium bisulfite, reaction products with hydrolyzed silyl compds. 28323-47-9DP, PSI 021, hydrolyzed, condensation products with hydrolyzed silyl compds. 31001-77-1DP, 3-Mercaptopropylmethyldimethoxysilane, hydrolyzed, condensed, oxidized 31692-79-2DP, DMS s12, hydrolyzed, condensation products with hydrolyzed silyl compds. 40372-72-3DP, SIB 1825.0, hydrolyzed, condensation products with hydrolyzed silyl compds., oxidized 51826-90-5DP, 3-Bromopropyltrimethoxysilane, hydrolyzed, condensed, reaction products with sodium bisulfite 52217-60-4DP, 1,8-Bis(triethoxysilyl)octane, hydrolyzed, condensation products with hydrolyzed silyl compds. 56706-10-6DP, KBE 886B, hydrolyzed, condensation products with hydrolyzed silyl compds., oxidized 70942-24-4DP, hydrolyzed, condensation products with hydrolyzed silyl compds. 87135-01-1DP, 1,6-Bis(trimethoxysilyl)hexane, hydrolyzed, condensation products with hydrolyzed silyl compds. 148229-61-2DP, hydrolyzed, condensation products with hydrolyzed silyl compds. 161000-64-2DP,

X-41-1805, hydrolyzed, condensation products with hydrolyzed silyl compds., oxidized 164849-42-7DP, X 40-2090, hydrolyzed, condensation products with hydrolyzed silyl compds. 469867-63-8DP, 1,8-Bis(diethoxymethylsilyl)octane, hydrolyzed, condensation products with hydrolyzed silyl compds. 469867-63-8DP, 1,8-Bis(diethoxymethylsilyl)octane, hydrolyzed, condensation products with hydrolyzed silyl compds., oxidized 524729-75-7DP, hydrolyzed, condensation products with hydrolyzed silyl compds., oxidized 524729-76-8DP, hydrolyzed, condensation products with hydrolyzed silyl compds., oxidized

(compns. and manufacture of proton conductive membranes for fuel cell electrolytes)

REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 13 OF 14 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2003:260048 HCAPLUS Full-text
DOCUMENT NUMBER: 138:274077
TITLE: Proton-conducting membrane and its manufacture for fuel cell
INVENTOR(S): Nakamura, Masanori; Nomura, Shigeki; Goto, Yasushi
PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 14 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003100316	A	20030404	JP 2001-289364	20010921
PRIORITY APPLN. INFO.:			JP 2001-289364	20010921

ED Entered STN: 04 Apr 2003

AB The membrane comprises (A) metal-O bond-containing tridimensional crosslinked structures (e.g., heat-curable alkoxysilanes), (B) fibers (e.g., glass fibers), and preferably (C) additives for H+ conductivity (e.g., phosphotungstic acid, silicotungstic acid, phosphomolybdic acid). The membrane is manufactured by (1) mixing liquid substances forming A and optionally C, (2) impregnating B with the mixture, and (3) curing the impregnated material by sol-gel reaction. The membrane has high resistance to heat and chems. and is suitable for a fuel cell operated at high temperature or a direct MeOH-type fuel cell.

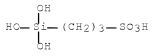
IT 503065-09-6P
(heat- and chemical resistant proton-conducting membrane and its manufacture for fuel cell)

RN 503065-09-6 HCAPLUS

CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)-, polymer with 4,4,13,13-tetraethoxy-3,14-dioxa-4,13-disilahexadecane (9CI) (CA INDEX NAME)

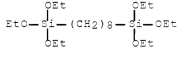
CM 1

CRN 70942-24-4
CMF C3 H10 O6 S Si



CM 2

CRN 52217-60-4
CMF C20 H46 O6 Si2



IC ICM H01M008-02
ICS C08G077-02; C08G079-00; C08J005-24; C08K003-00; C08K007-14; C08L027-12; C08L083-02; H01B001-06; H01B013-00; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST proton conductor membrane fuel cell electrolyte; alkoxysilane polymer heteropoly acid proton conducting membrane; glass fiber polysiloxane proton conductor membrane
IT Glass fibers, uses
(APP 25, RBP 060, sheet, membrane component; heat- and chemical resistant proton-conducting membrane and its manufacture for fuel cell)
IT Glass fibers, uses
(chopped, membrane component, RES 25; heat- and chemical resistant proton-conducting membrane and its manufacture for fuel cell)
IT Synthetic polymeric fibers, uses
(fluoropolymers, sheet, membrane component; heat- and chemical resistant proton-conducting membrane and its manufacture for fuel cell)
IT Fuel cell electrolytes
Sol-gel processing
(heat- and chemical resistant proton-conducting membrane and its manufacture for fuel cell)
IT Polysiloxanes, uses
Silsesquioxanes
(heat- and chemical resistant proton-conducting membrane and its manufacture for fuel cell)
IT Heteropoly acids
(molybdophosphoric; heat- and chemical resistant proton-conducting membrane and its manufacture for fuel cell)
IT Heteropoly acids
(tungstophosphoric, membrane containing; heat- and chemical resistant proton-conducting membrane and its manufacture for fuel cell)

IT Heteropoly acids
(tungstosilicic, membrane containing; heat- and chemical resistant proton-conducting membrane and its manufacture for fuel cell)
IT 25930-91-0P, Methyltriethoxysilane homopolymer 153315-80-1P 503065-09-6P 503065-10-9P
(heat- and chemical resistant proton-conducting membrane and its manufacture for fuel cell)
IT 11104-88-4, Molybdenum phosphorus hydroxide oxide 12067-99-1, Phosphotungstic acid 55957-17-0
(membrane containing; heat- and chemical resistant proton-conducting membrane and its manufacture for fuel cell)

L32 ANSWER 14 OF 14 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2003:242658 HCAPLUS Full-text
DOCUMENT NUMBER: 138:257917
TITLE: Membrane-electrode laminate, its manufacturing method, and solid polymer fuel cell using the laminate
INVENTOR(S): Nishikawa, Osamu; Nomura, Shigeki; Nakamura, Masanori; Sugimoto, Toshiya
PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan
SOURCE: PCT Int. Appl., 75 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003026051	A1	20030327	WO 2002-JP9144	20020909
W: CA, CN, JP, KR, US				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR				
JP 2003178770	A	20030627	JP 2002-377330	20010927
CA 2428131	A1	20030327	CA 2002-2428131	20020909
EP 1427043	A1	20040609	EP 2002-760815	20020909
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI, CY, TR, BG, CZ, EE, SK				
CN 1537340	A	20041013	CN 2002-802856	20020909
CN 100428549	C	20081022		
JP 4009593	B2	20071114	JP 2003-529561	20020909
KR 773635	B1	20071105	KR 2003-706329	20030509
US 20040053113	A1	20040318	US 2003-415891	20030909
PRIORITY APPLN. INFO.:			JP 2001-275259 A	20010911
			JP 2001-298030 A	20010927
			JP 2001-303239 A	20010928
			WO 2002-JP9144 W	20020909

ED Entered STN: 28 Mar 2003
AB The laminate has a gas diffusion electrode bonded on both sides of a proton conductive membrane; where the binding part of the laminate contains a metal-O bond-containing tridimensionally crosslinked structure formed by a sol-gel reaction ; and is prepared by applying a liquid comprising (1) a Si containing crosslinking monomer or (2) a Si containing crosslinking monomer and a noble metal catalyst supported carbon fine particles on at least 1 side of the

membrane; pasting (1) a catalyst supported gas diffusion electrode or (2) a gas diffusion electrode on the liquid, and curing the liquid Preferably, the tridimensionally crosslinked structure contains a proton conductive additive which is an inorg. acid.

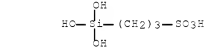
IT 503065-09-6P
(manufacture of electrode-membrane laminates containing crosslinking siloxane monomers and inorg. acids for fuel cells)

RN 503065-09-6 HCAPLUS

CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)-, polymer with 4,4,13,13-tetraethoxy-3,14-dioxa-4,13-disilahexadecane (9CI) (CA INDEX NAME)

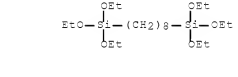
CM 1

CRN 70942-24-4
CMF C3 H10 O6 S Si



CM 2

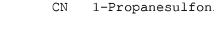
CRN 52217-60-4
CMF C20 H46 O6 Si2



IT 70942-24-4
(manufacture of electrode-membrane laminates containing crosslinking siloxane monomers and inorg. acids for fuel cells)

RN 70942-24-4 HCAPLUS

CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (CA INDEX NAME)



IC ICM H01M008-02
ICS H01M008-10

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST fuel cell electrolyte proton conductive crosslinked membrane laminate manuf

IT 11099-06-2P, Polytetraethoxysilane 25930-91-0P, Polymethyltriethoxysilane 503065-09-6P 503065-10-9P
(manufacture of electrode-membrane laminates containing crosslinking siloxane monomers and inorg. acids for fuel cells)

IT 78-10-4, Tetraethoxysilane 2031-67-6, Methyltriethoxysilane 52217-60-4, 1,8-Bis(triethoxysilyl)octane 70942-24-4
(manufacture of electrode-membrane laminates containing crosslinking siloxane monomers and inorg. acids for fuel cells)

REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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                  100-37-8/BI OR 102-71-6/BI OR 109-89-7/BI OR 110-89-4/BI
                  OR 113923-91-4/BI OR 121-44-8/BI OR 141098-23-9/BI OR
                  142-84-7/BI OR 29295-80-5/BI OR 352211-30-4/BI OR 438245-54
                  -6/BI OR 742079-37-4/BI OR 742079-38-5/BI OR 742079-40-9/BI
                   OR 78-81-9/BI)
L3                STR
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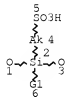


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NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
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NUMBER OF NODES IS   6

STEREO ATTRIBUTES: NONE
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L6            200 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L5
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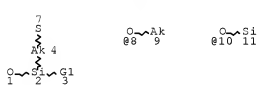


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NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   9

STEREO ATTRIBUTES: NONE
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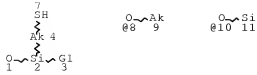


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VAR G1=O/AK/8/10
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   9

STEREO ATTRIBUTES: NONE
L17        1956 SEA FILE=REGISTRY SUB=L11 SSS FUL L15
L18         133 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L14
L19        6250 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L17
L20          33 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L18 AND PROTON(2A)CONDUCT?

L21        1517 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L19(L)PREP/RL
L28          30 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L18 AND ((EXCHANG? OR
                CONDUCT?)(2A)MEMBRAN? OR PEM OR MEA OR MEMBRANE ELECTRODE
                ASSEMBLY?)
L29          46 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L21 AND ((EXCHANG? OR
                CONDUCT?)(2A)MEMBRAN? OR PEM OR MEA OR MEMBRANE ELECTRODE
                ASSEMBLY?)
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                CONDUCT?)(2A)MEMBRAN? OR PEM OR MEA OR MEMBRANE ELECTRODE
                ASSEMBLY?)
L31          39 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L20 OR L28
L32          14 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L31 AND (L30 OR L29)
L33          25 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L31 NOT L32


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L33  ANSWER 1 OF 25  HCAPLUS  COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER:         2007:910902  HCAPLUS  Full-text
DOCUMENT NUMBER:          147:260268
TITLE:                    Proton-conducting composite
                          membranes and fuel cells
INVENTOR(S):              Matsuda, Toshihiko; Samura, Tetsuya
PATENT ASSIGNEE(S):       Kansai Research Institute Inc., Japan; Kinki
                          Yamaguchi Kagaku Y. K.
SOURCE:                   Jpn. Kokai Tokkyo Koho, 13pp.
                          CODEN: JKXXAF
DOCUMENT TYPE:            Patent
LANGUAGE:                 Japanese
FAMILY ACC. NUM. COUNT:   1
PATENT INFORMATION:

     PATENT NO.          KIND   DATE        APPLICATION NO.        DATE
     --------------      ----   --------    --------------------   --------
     JP 2007207522        A     20070816    JP 2006-23618          20060131
PRIORITY APPLN. INFO.:                      JP 2006-23618          20060131
```

ED Entered STN: 17 Aug 2007

AB The title composite films contain porous acid-modified polymers. Preferably, the porous layers contain fluoropolymers, heat-resistant thermoplastic resins, polyureas, or inorg. compds., which may be activated, e.g. with isocyanates, by radiation. Fuel cells comprising a pair of electrodes sandwiching the said composite films are also claimed. The films show high proton conductivity at a wide temperature range.

IT 945714-84-1
(fuel cells with porous acid-modified proton-conducting composite membranes)

RN 945714-84-1 HCAPLUS

CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)-, homopolymer (CA INDEX NAME)

CM 1

CRN 70942-24-4
CMF C3 H10 O6 S Si

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST proton conducting composite membrane fuel cell; acid contg porous polyurea fuel cell proton conductor; ionomer proton conductor fuel cell

IT Polyoxyalkylenes, uses
(acrylic; fuel cells with porous acid-modified proton-conducting composite membranes)

IT Porous materials
(films; fuel cells with porous acid-modified proton-conducting composite membranes)

IT Fuel cells
(fuel cells with porous acid-modified proton-conducting composite membranes)

IT Ionomers
(fuel cells with porous acid-modified proton-conducting composite membranes)

IT Polyimides, uses
(polyamide-, porous film; fuel cells with porous acid-modified proton-conducting composite membranes)

IT Polyamides, uses
(polyimide-, porous film; fuel cells with porous acid-modified proton-conducting composite membranes)

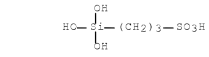
IT Polyimides, uses
(porous film; fuel cells with porous acid-modified proton-conducting composite membranes)

IT Films
(porous; fuel cells with porous acid-modified proton-conducting composite membranes)

IT Fluoropolymers, uses
Polyureas

(porous; fuel cells with porous acid-modified proton-conducting composite membranes)
IT Ionic conductors
(proton; fuel cells with porous acid-modified proton-conducting composite membranes)
IT Plastics, uses
(thermoplastics, porous; fuel cells with porous acid-modified proton-conducting composite membranes)
IT 98-11-3D, Benzenesulfonic acid, aryloxy derivs., sodium salt 109-90-0D, Ethyl isocyanate, (meth)acryloyloxy, reaction products with UPILEX-PT 27119-07-9, 2-Acrylamido-2-methyl propanesulfonic acid homopolymer 75482-18-7, CPI-100P 928216-25-5 945714-83-0 945714-84-1
(fuel cells with porous acid-modified proton-conducting composite membranes)
IT 9011-17-0, Hexafluoropropylene-vinylidene fluoride copolymer 74403-26-2 862371-97-9, Upilex PT 862371-97-9D, Upilex PT, reaction products with (meth)acryloyloxyethyl isocyanate 945739-62-8, BCL 1416T2
(porous film; fuel cells with porous acid-modified proton-conducting composite membranes)
IT 133136-87-5, Nipsil SS 50F
(porous polyurea film containing; fuel cells with porous acid-modified proton-conducting composite membranes)

L33 ANSWER 2 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2007:834330 HCAPLUS Full-text
DOCUMENT NUMBER: 149:496639
TITLE: Novel bronsted acid-base complexes for proton exchange membrane fuel cells
AUTHOR(S): Chacko, Annie; Musselman, Inga H.; Yang, D. J.; Balkus, Kenneth J., Jr.; Ferraris, John P.
CORPORATE SOURCE: Department of Chemistry, University of Texas at Dallas, Richardson, TX, 75080, USA
SOURCE: Preprints of Symposia - American Chemical Society, Division of Fuel Chemistry (2007), 52(2), 390-391 CODEN: PSADFZ; ISSN: 1521-4648
PUBLISHER: American Chemical Society, Division of Fuel Chemistry
DOCUMENT TYPE: Journal; (computer optical disk)
LANGUAGE: English
ED Entered STN: 01 Aug 2007
AB Novel acid-doped triazole (3-amino-1,2,4-triazole) membranes have been successfully prepared The p conductivities of 3-trihydroxysilylpropane sulfonic acid doped aminotriazole were studied as a function of cell temperature and humidity. The membranes exhibited p conductivities of 10-2 S/cm at higher temps. and fully humidified conditions. The p conductivities of the membranes increase with increasing relative humidities. Thus, the acid doped aminotriazole membranes are very promising candidates for use in fuel cells, and their further development, as well as their performance in H2/O2 fuel cells is currently under study.
IT 70942-24-4, 3-Trihydroxysilyl-1-propane sulfonic acid
(novel bronsted acid-base complexes for proton exchange membrane fuel cells)
RN 70942-24-4 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST proton exchange membrane fuel cell bronsted acid base complex
IT Sol-gel processing
Thermal analysis
(novel bronsted acid-base complexes for proton exchange membrane fuel cells)
IT Fuel cells
(proton exchange membrane; novel bronsted acid-base complexes for proton exchange membrane fuel cells)
IT Ionic conductivity
(proton; novel bronsted acid-base complexes for proton exchange membrane fuel cells)
IT Humidity
(relative; novel bronsted acid-base complexes for proton exchange membrane fuel cells)
IT 70942-24-4, 3-Trihydroxysilyl-1-propane sulfonic acid
(novel bronsted acid-base complexes for proton exchange membrane fuel cells)
IT 2530-83-8, 3-Glycidoxypropyl trimethoxysilane 7440-05-3, Palladium, uses 7440-57-5, Gold, uses
(novel bronsted acid-base complexes for proton exchange membrane fuel cells)
IT 61-82-5, 3-Amino-1,2,4-triazole
(novel bronsted acid-base complexes for proton exchange membrane fuel cells)
REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 3 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2007:834268 HCAPLUS Full-text
DOCUMENT NUMBER: 149:579332
TITLE: Novel polysilsesquioxane hybrid membranes for proton exchange membrane fuel cell (PEMFC) applications
AUTHOR(S): Kalaw, Grace Jones D.; Yang, Zhiwei; Musselman, Inga H.; Yang, Duck-Joo; Balkus, Kenneth J., Jr.; Ferraris, John P.
CORPORATE SOURCE: Department of Chemistry, The University of Texas at Dallas, Richardson, TX, 75080, USA
SOURCE: Preprints of Symposia - American Chemical Society, Division of Fuel Chemistry (2007), 52(2), 260-262
CODEN: PSADFZ; ISSN: 1521-4648
PUBLISHER: American Chemical Society, Division of Fuel Chemistry
DOCUMENT TYPE: Journal; (computer optical disk)
LANGUAGE: English
ED Entered STN: 01 Aug 2007
AB This study describes new p-conducting membranes based on hybrid inorg.-organic polymers with sulfonic and phosphonic acid groups synthesized through a sol-

gel route having low cost and benign environmental impact. These tough and flexible membranes exhibited hydrolytic stability over long periods of time and high p conductivities at low relative humidity conditions over a wide range of temps. The p conductivity of these membranes increased with the increased amount of acid content and relative humidity conditions, indicating its strong dependence on the presence of H2O.

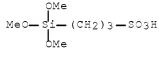
IT 1082815-89-1 1082815-89-1D, reaction product with polyphthalocyanine
(novel polysilsesquioxane hybrid membranes for proton exchange membrane fuel cell applications)

RN 1082815-89-1 HCAPLUS

CN 1-Propanesulfonic acid, 3-(trimethoxysilyl)-, polymer with α-[3-(dimethoxymethylsilyl)propyl]-ω-[3-(dimethoxymethylsilyl)propoxy]poly[oxy(methyl-1,2-ethanediyl)] and 4,4,13,13-tetraethoxy-3,14-dioxa-4,13-disilahexadecane (CA INDEX NAME)

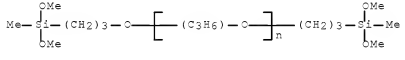
CM 1

CRN 79059-66-8
CMF C6 H16 O6 S Si



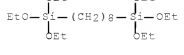
CM 2

CRN 75009-88-0
CMF (C3 H6 O)n C12 H30 O5 Si2
CCI IDS, PMS



CM 3

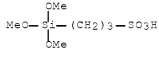
CRN 52217-60-4
CMF C20 H46 O6 Si2



RN 1082815-89-1 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trimethoxysilyl)-, polymer with α-[3-(dimethoxymethylsilyl)propyl]-ω-[3-(dimethoxymethylsilyl)propoxy]poly[oxy(methyl-1,2-ethanediyl)] and 4,4,13,13-tetraethoxy-3,14-dioxa-4,13-disilahexadecane (CA INDEX NAME)

CM 1

CRN 79059-66-8
CMF C6 H16 O6 S Si



CM 2

CRN 75009-88-0
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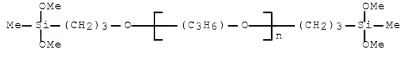
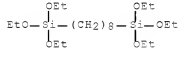
CCI IDS, PMS



CM 3

CRN 52217-60-4
CMF C20 H46 O6 Si2



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST proton exchange membrane fuel cell
polysilsesquioxane hybrid membrane
IT Silsesquioxanes

(Et phosphonic/propyl sulfonic; novel polysilsesquioxane hybrid membranes for proton exchange membrane fuel cell applications)
IT Sol-gel processing
(polymerization; novel polysilsesquioxane hybrid membranes for proton exchange membrane fuel cell applications)
IT Fuel cells
(proton exchange membrane; novel polysilsesquioxane hybrid membranes for proton exchange membrane fuel cell applications)
IT Ionic conductivity
(proton; novel polysilsesquioxane hybrid membranes for proton exchange membrane fuel cell applications)
IT Humidity
(relative; novel polysilsesquioxane hybrid membranes for proton exchange membrane fuel cell applications)
IT Polymerization
(sol-gel; novel polysilsesquioxane hybrid membranes for proton exchange membrane fuel cell applications)
IT 1066-42-8, Dimethylsilanediol 2615-18-1 27290-25-1D, Polyphthalocyanine, reaction product with silsesquioxanes 148599-42-2 1082815-89-1 1082815-89-1D, reaction product with polyphthalocyanine 1082815-90-4 1082815-90-4D, reaction product with polyphthalocyanine
(novel polysilsesquioxane hybrid membranes for proton exchange membrane fuel cell applications)
REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 4 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2007:816570 HCAPLUS Full-text
DOCUMENT NUMBER: 147:169823
TITLE: Catalyst pastes for polymer electrolyte fuel cells
INVENTOR(S): Takahashi, Mitsuhito; Oba, Toshio; Kawada, Atsuo; Konishi, Shigeru
PATENT ASSIGNEE(S): Shin-Etsu Chemical Industry Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007188753	A	20070726	JP 2006-5804	20060113
PRIORITY APPLN. INFO.:			JP 2006-5804	20060113

ED Entered STN: 27 Jul 2007
AB The title paste contains (1) catalyst particles, (2) alkoxysilanes having ion-conducting groups, e.g. sulfonic acid group, or their hydrolyzates, and (3) polyethers, e.g. polytetramethylene glycol, terminated with alkoxysilyl groups via amide bonds, urethane bonds, or urea bonds. The pastes are especially suitable for preparation of membrane electrode assemblies for direct methanol fuel cells.

IT 70942-24-4
(catalyst pastes containing ion-conducting alkoxysilanes and alkoxysilyl-terminated polyethers for preparation of MEA for PEFC)
RN 70942-24-4 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (CA INDEX NAME)

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Fuel cell electrodes
(catalytic; catalyst pastes containing ion-conducting alkoxysilanes and alkoxysilyl-terminated polyethers for preparation of MEA for PEFC)
IT Fuel cells
(polymer electrolyte, catalyst pastes for; catalyst pastes containing ion-conducting alkoxysilanes and alkoxysilyl-terminated polyethers for preparation of MEA for PEFC)
IT Polyurethanes, uses
(polyoxyalkylene-, alkoxysilyl-terminated; catalyst pastes containing ion-conducting alkoxysilanes and alkoxysilyl-terminated polyethers for preparation of MEA for PEFC)
IT 7440-06-4, Platinum, uses 12779-05-4 70942-24-4 390761-63-4, TEC 10E50E 501004-25-7, TEC 61E54
(catalyst pastes containing ion-conducting alkoxysilanes and alkoxysilyl-terminated polyethers for preparation of MEA for PEFC)
IT 3179-76-8DP, γ-Aminopropylmethyldiethoxysilane, reaction products with polytetramethylene glycol-2,4-tolylene diisocyanate copolymer 9050-83-3DP, Polytetramethylene glycol-2,4-tolylene diisocyanate copolymer, reaction products with γ-aminopropylmethyldiethoxysilane
(catalyst pastes containing ion-conducting alkoxysilanes and alkoxysilyl-terminated polyethers for preparation of MEA for PEFC)
IT 7440-44-0, Carbon, uses
(catalyst support; catalyst pastes containing ion-conducting alkoxysilanes and alkoxysilyl-terminated polyethers for preparation of MEA for PEFC)

L33 ANSWER 5 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2007:460384 HCAPLUS Full-text
DOCUMENT NUMBER: 146:473255
TITLE: Porous protonic conductors, manufacture of protonic conductors, sulfonic group-containing copolymers, and electrochemistry devices
INVENTOR(S): Mal, Nawal Kishor; Hikuma, Koichiro
PATENT ASSIGNEE(S): Sony Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 18pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007109415	A	20070426	JP 2005-296016	20051011
PRIORITY APPLN. INFO.:			JP 2005-296016	20051011

ED Entered STN: 27 Apr 2007

AB The title manufacture of sulfonic group-containing copolymer porous protonic conductors involves (1) preparing a thiol-containing copolymer porous material (SiO1.5-CH2CH2CH2-SH)x+y(SiO1.5-CH2-SiO1.5)z (x+y+2z=1) from (3-mercaptopropyl)trialkoxysilane, bis(trialkoxysilyl)methane, water, and a surfactant and (2) oxidizing the thiol group to give sulfonic group-containing copolymer porous protonic conductor (SiO1.5-CH2CH2CH2-SO3H)x(SiO1.5-CH2CH2CH2-SH)y(SiO1.5-CH2- SiO1.5)z•nH2O. The prepared protonic conductor provides excellent protonic conductivity with thermal, mech., and chemical stability in the range of operating conditions even at low moisture condition in electrochem. devices such as fuel cells.

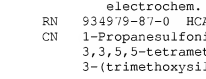
IT 934979-87-0P, (3-Mercaptopropyl)trimethoxysilane-(3-sulfopropyl)trimethoxysilane-bis(trimethoxysilyl)methane copolymer
(porous protonic conductor; porous protonic conductors and manufacture of protonic conductors and sulfonic group-containing copolymers and electrochem. devices)

RN 934979-87-0 HCAPLUS

CN 1-Propanesulfonic acid, 3-(trimethoxysilyl)-, polymer with 3,3,5,5-tetramethoxy-2,6-dioxa-3,5-disilaheptane and 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

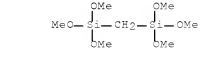
CM 1

CRN 79059-66-8
CMF C6 H16 O6 S Si



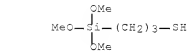
CM 2

CRN 5926-29-4
CMF C7 H20 O6 Si2



CM 3

CRN 4420-74-0
CMF C6 H16 O3 S Si

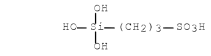


CC 76-2 (Electric Phenomena)
Section cross-reference(s): 38
IT Ionic conductivity
(proton; porous protonic conductors and manufacture of protonic conductors and sulfonic group-containing copolymers and electrochem. devices)
IT 934979-87-0P, (3-Mercaptopropyl)trimethoxysilane-(3-sulfopropyl)trimethoxysilane-bis(trimethoxysilyl)methane copolymer
(porous protonic conductor; porous protonic conductors and manufacture of protonic conductors and sulfonic group-containing copolymers and electrochem. devices)

L33 ANSWER 6 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2006:949087 HCAPLUS Full-text
DOCUMENT NUMBER: 145:317977
TITLE: Solid electrolyte compositions and polymer electrolyte fuel cells
INVENTOR(S): Cooray, Nawalage Florence; Takei, Fumio
PATENT ASSIGNEE(S): Fujitsu Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 19pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2006244920	A	20060914	JP 2005-61261	20050304
PRIORITY APPLN. INFO.:			JP 2005-61261	20050304

ED Entered STN: 15 Sep 2006
AB The compns. comprise SO3H group-containing proton- conducting resins and inorg-organic composites consisting of inorg. parts containing Si, Al, Ti, Sn, and/or Zr and O and proton -conducting organic parts. Optionally, the compns. comprise inorg. substances containing Ca, Si, Al, Mg, Ti, Sn, Zr, and/or P and O. The fuel cells, especially direct methanol fuel cells, using the compns. provide high cell performance under high humidity conditions.
IT 70942-24-4
(solid electrolyte compns. containing proton-conducting resins and inorg-organic composites for polymer electrolyte fuel cells)
RN 70942-24-4 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 76
ST solid electrolyte compn sulfonic acid proton conducting polymer DMFC; direct methanol fuel cell solid electrolyte inorg org composite
IT Polyoxyalkylenes, uses
(fluorine- and sulfo-containing, ionomers; solid electrolyte compns. containing proton-conducting resins and inorg-organic composites for polymer electrolyte fuel cells)
IT Fuel cells
(polymer electrolyte, direct methanol; solid electrolyte compns. containing proton-conducting resins and inorg-organic composites for polymer electrolyte fuel cells)
IT Fluoropolymers, uses
(polyoxyalkylene-, sulfo-containing, ionomers; solid electrolyte compns. containing proton-conducting resins and inorg-organic composites for polymer electrolyte fuel cells)
IT Ionomers
(polyoxyalkylenes, fluorine- and sulfo-containing; solid electrolyte compns. containing proton-conducting resins and inorg-organic composites for polymer electrolyte fuel cells)
IT Hybrid organic-inorganic materials
Solid electrolytes
(solid electrolyte compns. containing proton-conducting resins and inorg-organic composites for polymer electrolyte fuel cells)
IT Zeolite 4A
(solid electrolyte compns. containing proton-conducting resins and inorg-organic composites for polymer electrolyte fuel cells)
IT 78-10-4, Tetraethoxysilane 63496-24-2, Nafion EW 1100 70942-24-4 163294-14-2, Nafion 112 909400-80-2
(solid electrolyte compns. containing proton-conducting resins and inorg-organic composites for polymer electrolyte fuel cells)

L33 ANSWER 7 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2006:169853 HCAPLUS Full-text
DOCUMENT NUMBER: 144:236264
TITLE: Electrodes containing crosslinked proton conductors and their manufacture for polymer electrolyte fuel cells
INVENTOR(S): Nishikawa, Satoru; Sugimoto, Toshiya; Koma, Satoshi; Konno, Yoshiharu; Nomura, Shigeki
PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 25 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2006054176	A	20060223	JP 2005-209095	20050719
PRIORITY APPLN. INFO.:			JP 2004-210226 A	20040716

ED Entered STN: 24 Feb 2006

AB The title electrodes are equipped with (i) porous conductors, (ii) catalyst layers, and (iii) gas-diffusion layers, where the catalyst layers contain (b1) proton conductors, (b2) catalysts-containing electron-conducting C, and (b3) electron-conducting C. The proton conductors consist of (a) metal-O bond crosslinked structure and (b) acid-containing structure having an acid group covalent bonded with metal-O bond crosslinked structure, e.g., tetraethoxysilane-3-(trihydroxysilyl)-1-propanesulfonic acid copolymer. The title process comprises steps of (1) mixing b2 with an acid group-containing structure to give slurries, (2) mixing the slurries with a to give pastes, (3) adding b3 to the pastes, (4) coating the pastes on porous conductors having gas-diffusion layer and pressing to give catalyst layers, and then (5) drying the catalyst layers and hot pressing the electrodes. The electrodes show high resistance to heat and chems. and the resulting fuel cells provide high stability under high temperature and high humidity.

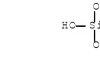
IT 154619-15-5P
(manufacture of electrodes containing crosslinked proton conductors for polymer electrolyte fuel cells)

RN 154619-15-5 HCAPLUS

CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)-, polymer with silicic acid (H4SiO4) tetraethyl ester (CA INDEX NAME)

CM 1

CRN 70942-24-4
CMF C3 H10 O6 S Si



CM 2

CRN 78-10-4
CMF C8 H20 O4 Si

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST electrode crosslinked proton conductor polymer

electrolyte fuel cell; sulfonic acid siloxane proton conductor fuel cell electrode

IT Carbon black, uses
(Denka Black AB 12, electrodes containing; manufacture of electrodes containing
crosslinked proton conductors for polymer electrolyte fuel cells)

IT Graphitized carbon black
(Ketjen Black EC, electrodes containing; manufacture of electrodes containing
crosslinked proton conductors for polymer electrolyte fuel cells)

IT Fuel cell electrodes
(gas diffusion; manufacture of electrodes containing crosslinked proton conductors for polymer electrolyte fuel cells)

IT Fuel cells
(polymer electrolyte; manufacture of electrodes containing crosslinked proton conductors for polymer electrolyte fuel cells)

IT Polysiloxanes, uses
(sulfo group-containing; manufacture of electrodes containing crosslinked proton conductors for polymer electrolyte fuel cells)

IT 7440-06-4, Platinum, uses
(electrode catalyst; manufacture of electrodes containing crosslinked proton conductors for polymer electrolyte fuel cells)

IT 291280-30-3, TGP-H 120
(electrodes containing; manufacture of electrodes containing crosslinked proton conductors for polymer electrolyte fuel cells)

IT 154619-15-5P
(manufacture of electrodes containing crosslinked proton conductors for polymer electrolyte fuel cells)

L33 ANSWER 8 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2006:56286 HCAPLUS Full-text
DOCUMENT NUMBER: 144:322107
TITLE: Electrical spectroscopy studies of two new siloxanic proton conducting membranes
AUTHOR(S): Di Noto, Vito; Vittadello, Michele; Zago, Vanni; Pace, Giuseppe; Vidali, Maurizio
CORPORATE SOURCE: Dipartimento di Scienze Chimiche, Universita di Padova, Padua, I-35135, Italy
SOURCE: Electrochimica Acta (2006), 51(8-9), 1602-1610
CODEN: ELCAAV; ISSN: 0013-4686
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 20 Jan 2006
AB This contribution is focused on the conductivity study and the protonic transfer study of two new siloxanic membranes. The conductivity of the systems was studied within the temperature range $5° \leq T \leq 145°$, both for pristine and hydrated membranes. Membrane A was hydrated up to 33.12% in weight, while in B up to 27.76%. The conductivity of these membranes showed a temperature dependence of the Arrhenius type variable in the interval $1.6 + 10-4 \leq \sigma A \leq 2.3 + 10-3$ S cm-1 and $1.3 + 10-5 \leq \sigma B \leq 2.9 + 10-4$ S cm-1, resp., for A and B. In particular, conductivities of 2 + 10-3 S cm-1 (A) and

of 2 + 10-4 S cm-1 (B) at 125° were observed The conductivity mechanism was studied by using broad band elec. spectroscopy in the region between 40 Hz and 10 MHz. This study, for both the materials showed the presence at low frequencies (102 ≤ f β ≤ 104 Hz) of β relaxations related to the sulfonic side chain dynamics. The activation energy measured for this mol. dynamics is about .simeq.30 kJ mol-1 and corresponds to the typical interaction energy associated with hydrogen bonding. Also, the activation energies determined from the conductivity measurements are 12 and 14 kJ mol-1, resp., for A and B. This shows that the protonic conductivity is strongly influenced by the side chain dynamics and the charge migration occurs through an ion hopping mechanism between different regions, consisting of micro-clusters of hydration water coordinated with the polar sulfonic groups of the side chains. The comparable activation energies and the values of the conductivity demonstrate that in these systems the conductivity is proportional to the concentration of the sulfonic groups. Also these kinds of membranes, with a high concentration of SO3H are necessary to obtain materials with a high protonic conductivity with the capacity to retain water in bulk up to 145°.

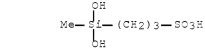
IT 879367-30-3, siloxane grafted derivs., trimethylsilyl-terminated, platinum surface complexes
(elec. spectroscopy and mol. dynamics of siloxanic proton conducting membranes)

RN 879367-30-3 HCAPLUS

CN 1-Propanesulfonic acid, 3-(dihydroxymethylsilyl)-, polymer with methylsilanediol (9CI) (CA INDEX NAME)

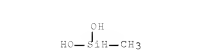
CM 1

CRN 184831-66-1
CMF C4 H12 O5 S Si



CM 2

CRN 43641-90-3
CMF C H6 O2 Si



CC 76-2 (Electric Phenomena)
Section cross-reference(s): 66

ST cond siloxanic proton conducting membrane

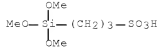
IT Activation energy
Dielectric constant
Electric conductivity

Hydrogen bond
Ionic conductors
Molecular dynamics
(elec. spectroscopy and mol. dynamics of siloxanic proton conducting membranes)
IT Polysiloxanes, properties
(elec. spectroscopy and mol. dynamics of siloxanic proton conducting membranes)
IT Electric conductors
(membrane; elec. spectroscopy and mol. dynamics of siloxanic proton conducting membranes)
IT 879367-30-3D, siloxane grafted derivs., trimethylsilyl-terminated, platinum surface complexes
(elec. spectroscopy and mol. dynamics of siloxanic proton conducting membranes)
REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 9 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2005:1335309 HCAPLUS Full-text
DOCUMENT NUMBER: 144:70834
TITLE: Modified inorganic material with good ion exchange capacity for composite electrolyte membrane and fuel cell and its preparation
INVENTOR(S): Kim, Hae-Kyoung; Lee, Jae-Sung; Lee, Hyun-Chul; Chang, Hyuk; Rhee, Chang-Houn
PATENT ASSIGNEE(S): S. Korea
SOURCE: U.S. Pat. Appl. Publ., 14 pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20050282052	A1	20051222	US 2005-150366	20050613
KR 2005119888	A	20051222	KR 2004-45026	20040617
CN 1710743	A	20051221	CN 2005-10065216	20050414
CN 100373679	C	20080305		
JP 2006016297	A	20060119	JP 2005-176146	20050616
PRIORITY APPLN. INFO.:			KR 2004-45026 A	20040617

ED Entered STN: 23 Dec 2005
AB The modified inorg. material comprises an inorg. material, and a cation exchanger bonded to the inorg. material. The modified inorg. material is prepared by hydrothermally synthesizing a mixture of a surfactant containing -SH, (e.g, 3-Mercaptopropyl trimethoxysilane), an inorg. material precursor (e.g., tris(2-butoxy)aluminum) and water to produce a precipitation; oxidizing the precipitation using an oxidant; and sulfonating the oxidized precipitation
IT 79059-66-8, 3-Sulfopropyltrimethoxysilane
(surfactant, oxides modified with; modified inorg. material with good ion exchange capacity for composite electrolyte membrane and fuel cell)
RN 79059-66-8 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trimethoxysilyl)- (CA INDEX NAME)

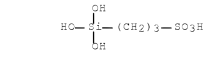


IC ICM C08J005-22
INCL 429033000; 521027000
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 52
IT Membranes, nonbiological
(elec. conductive, electrolyte; modified inorg. material with good ion exchange capacity for composite electrolyte membrane and fuel cell)
IT Conducting polymers
(proton; modified inorg. material with good ion exchange capacity for composite electrolyte membrane and fuel cell)
IT 79059-66-8, 3-Sulfopropyltrimethoxysilane
(surfactant, oxides modified with; modified inorg. material with good ion exchange capacity for composite electrolyte membrane and fuel cell)

L33 ANSWER 10 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2005:98387 HCAPLUS Full-text
DOCUMENT NUMBER: 142:180506
TITLE: Electrode catalyst layer for solid polymer fuel cell, the electrode, an the fuel cell
INVENTOR(S): Nishikawa, Satoru; Watanabe, Masahiro; Uchida, Hiroyuki; Miyatake, Kenji
PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan; Yamanashi T.L.O. K. K.
SOURCE: Jpn. Kokai Tokkyo Koho, 21 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005032668	A	20050203	JP 2003-272905	20030710
PRIORITY APPLN. INFO.:			JP 2003-272905	20030710

ED Entered STN: 04 Feb 2005
AB The catalyst layer comprises a proton conductor and an electronic conductor, made of Pt catalyst and C black; where the proton conductor is formed inside the C black agglomerates or in the pores among the agglomerates. The electrode has the above catalyst layer on 1 side of a porous body. The fuel cell uses the above electrode.
IT 70942-24-4, 3-Trihydroxy silyl-1-propane sulfonic acid
(electrode catalyst layers containing proton conductors and catalyst loaded carbon black for fuel cells)
RN 70942-24-4 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (CA INDEX NAME)



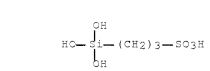
IC ICM H01M004-96
ICS H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST fuel cell electrode catalyst platinum carbon black proton conductor
IT Fuel cell electrodes
(electrode catalyst layers containing proton conductors and catalyst loaded carbon black for fuel cells)
IT Carbon black, uses
(electrode catalyst layers containing proton conductors and catalyst loaded carbon black for fuel cells)
IT 7440-06-4, Platinum, uses 70942-24-4, 3-Trihydroxy silyl-1-propane sulfonic acid
(electrode catalyst layers containing proton conductors and catalyst loaded carbon black for fuel cells)

L33 ANSWER 11 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2005:72979 HCAPLUS Full-text
DOCUMENT NUMBER: 142:159540
TITLE: Electrode for solid polymer fuel cell and its manufacture
INVENTOR(S): Nishikawa, Satoru; Watanabe, Masahiro; Uchida, Hiroyuki; Miyatake, Kenji
PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan; Yamanashi T.L.O. K. K.
SOURCE: Jpn. Kokai Tokkyo Koho, 31 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
JP 2005026207	A	20050127	JP 2004-65899		20040309
PRIORITY APPLN. INFO.:			JP 2003-64078	A	20030310
			JP 2003-167479	A	20030612

ED Entered STN: 28 Jan 2005
AB The electrode contains a porous conductor and a catalyst layer; where the catalyst layer is formed by a mixture of a H+-conductor and a catalyst, having Pt loaded on C black; and the H+-conductor comprises a crosslinked structure, consisting of metal-O bond by sol gel reaction, and an acid group containing structure, bonded by covalent binding with the crosslinked structure. The electrode is manufactured by mixing the required catalyst with an acid group containing compound to obtain a slurry; mixing the slurry with a hardening material to obtain a paste; applying the paste on the porous conductor to obtain a sheet material; drying; and pressing.
IT 70942-24-4
(structure and manufacture electrodes containing catalyst load C and proton conductors in catalyst layers fuel cells)

RN 70942-24-4 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (CA INDEX NAME)



IC ICM H01M004-96
ICS H01M004-88; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Fuel cell electrodes
(structure and manufacture electrodes containing catalyst load C and proton conductors in catalyst layers fuel cells)
IT Carbon black, uses
Fluoropolymers, uses
(structure and manufacture electrodes containing catalyst load C and proton conductors in catalyst layers fuel cells)
IT 7440-06-4, Platinum, uses
(structure and manufacture electrodes containing catalyst load C and proton conductors in catalyst layers fuel cells)
IT 9002-84-0, PTFE 25067-11-2, Hexafluoropropylene-tetrafluoroethylene copolymer
(structure and manufacture electrodes containing catalyst load C and proton conductors in catalyst layers fuel cells)
IT 52217-60-4, 1,8-Bis(triethoxy silyl) octane 70942-24-4
(structure and manufacture electrodes containing catalyst load C and proton conductors in catalyst layers fuel cells)

L33 ANSWER 12 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2004:965518 HCAPLUS Full-text
DOCUMENT NUMBER: 141:413617
TITLE: Proton conductive film, its manufacture, and fuel cell using the film
INVENTOR(S): Miyama, Toshihito; Sugimoto, Toshiya; Nomura, Shigeki
PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan
SOURCE: PCT Int. Appl., 82 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004097850	A1	20041111	WO 2004-JP5885	20040423
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE,				

DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

CA 2520827	A1	20041111	CA 2004-2520827		20040423
EP 1619692	A1	20060125	EP 2004-729222		20040423
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK, HR					
TW 251368	B	20060311	TW 2004-93111399		20040423
CN 1781162	A	20060531	CN 2004-80011145		20040423
CN 100416708	C	20080903			
US 20060219981	A1	20061005	US 2005-554222		20051024
PRIORITY APPLN. INFO.:			JP 2003-122766	A	20030425
			JP 2004-9471	A	20040116
			WO 2004-JP5885	W	20040423

ED Entered STN: 12 Nov 2004

AB A proton-conductive film which is excellent in heat resistance, durability, dimensional stability, fuel-barrier properties, flexibility, etc. and has excellent proton conductivity even at high temps.; a process for producing the film; and a fuel cell which can stably work at high temps. The proton-conductive film comprises; base comprising an organic/inorg.composite structure (α) which has a crosslinked structure formed through metal oxygen bonds and has an interconnecting pore structure in which press formed inside by the crosslinked structure are interconnected; and a proton- conductive structure (β) comprising an acid-containing structure having an acid group, the pores of the base being filled with the structure (β). A fuel cell with excellent performances can be obtained by suing the proton-conductive film.

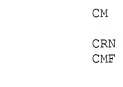
IT 154619-15-5P 273735-07-2P 792931-71-6P
(composite proton conductive inorg.-organic films for fuel cells)

RN 154619-15-5 HCAPLUS

CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)-, polymer with silicic acid (H4SiO4) tetraethyl ester (CA INDEX NAME)

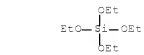
CM 1

CRN 70942-24-4
CMF C3 H10 O6 S Si



CM 2

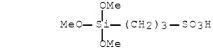
CRN 78-10-4
CMF C8 H20 O4 Si



RN 273735-07-2 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trimethoxysilyl)-, polymer with silicic acid (H4SiO4) tetraethyl ester (9CI) (CA INDEX NAME)

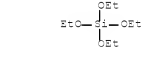
CM 1

CRN 79059-66-8
CMF C6 H16 O6 S Si



CM 2

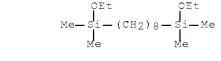
CRN 78-10-4
CMF C8 H20 O4 Si



RN 792931-71-6 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)-, polymer with 4,4,13,13-tetramethyl-3,14-dioxa-4,13-disilahexadecane (9CI) (CA INDEX NAME)

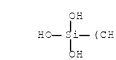
CM 1

CRN 524729-76-8
CMF C16 H38 O2 Si2



CM 2

CRN 70942-24-4
CMF C3 H10 O6 S Si



IC ICM H01B001-06
ICS H01M008-02; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST fuel cell proton conductive bridged inorg org film
manuf; silicon bridged org proton conductive film
fuel cell
IT Fuel cells
(PEFC; composite proton conductive inorg.-organic
films for fuel cells)
IT Fuel cell electrolytes
(composite proton conductive inorg.-organic films
for fuel cells)
IT 154619-15-5P 161000-64-2P 273735-07-2P
770733-64-7P 792931-71-6P 792931-72-7P 792931-73-8P
(composite proton conductive inorg.-organic films
for fuel cells)
REFERENCE COUNT: 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

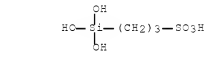
L33 ANSWER 13 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2004:938530 HCAPLUS Full-text
DOCUMENT NUMBER: 142:117499
TITLE: Preparation of the electrode for high temperature PEFCs using novel polymer electrolytes based on organic/inorganic nanohybrids
AUTHOR(S): Nishikawa, Osamu; Sugimoto, Toshiya; Nomura, Shigeki; Doyama, Kazuo; Miyatake, Kenji; Uchida, Hiroyuki; Watanabe, Masahiro
CORPORATE SOURCE: NBO Development Center, Sekisui Chemical Co. Ltd., Tsukuba, 300-4292, Japan
SOURCE: Electrochimica Acta (2004), 50(2-3), 667-672
CODEN: ELCAAV; ISSN: 0013-4686
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 08 Nov 2004
AB Novel organic/inorg. hybrid electrolytes for high-temperature polymer electrolyte fuel cells (PEFCs) were synthesized from 1,8-bis(triethoxysilyl)octane (TES-Oct) and 3-(trihydroxysilyl)-1-propanesulfonic acid ((THS)Pro-SO3H) via the sol-gel process. The membranes with sulfonic acid groups covalently bonded to the silica showed higher proton conductivity, of 5 + 10-2 S/cm at 160°, than that of previously reported homologous

materials containing phosphotungstic acid as acid function. A series of electrodes with different composition of the organic/inorg. nanohybrid materials to the platinum loaded carbon were prepared in order to elucidate the availability of the electrolytes in the catalyst layer. By optimizing the composition of the nanohybrids, high electrode performance comparable to that using Nafion ionomer was obtained. The novel organic/inorg. hybrid materials thus have proved to be a promising material as the ionomer in the electrodes and the electrolyte membranes for high-temperature PEFCs.

IT 70942-24-4DP, 3-(Trihydroxysilyl)-1-propanesulfonic acid, reaction products with bis(triethoxysilyl)octane and silica
(nanohybrid material, fuel cell separator; silica-based organic-inorg. nanohybrid materials as ionomer separators and electrolytes for PEFCs)

RN 70942-24-4 HCAPLUS

CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST polymer electrolyte fuel cell hybrid inorg org separator; silica org hybrid separator fuel cell; proton cond silica org hybrid ionomer fuel cell separator

IT Ionic conductivity
(proton; silica-based organic-inorg. nanohybrid materials as ionomer separators and electrolytes for PEFCs)

IT 7631-86-9DP, Silica, reaction products with bis(triethoxysilyl)octane and (trihydroxysilyl)propanesulfonic acid 52217-60-4DP, 1,8-Bis(triethoxysilyl)octane, reaction products with (trihydroxysilyl)propanesulfonic acid and silica 70942-24-4DP, 3-(Trihydroxysilyl)-1-propanesulfonic acid, reaction products with bis(triethoxysilyl)octane and silica
(nanohybrid material, fuel cell separator; silica-based organic-inorg. nanohybrid materials as ionomer separators and electrolytes for PEFCs)

REFERENCE COUNT: 51 THERE ARE 51 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 14 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2004:474757 HCAPLUS Full-text

DOCUMENT NUMBER: 141:9727

TITLE: Electrode-electrolyte laminate and fuel cell using the laminate

INVENTOR(S): Nakamura, Masanori; Masakado, Akio

PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 13 pp.
CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

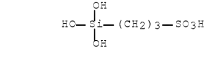
FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

JP 2004165047	A	20040610	JP 2002-331000	20021114
PRIORITY APPLN. INFO.:			JP 2002-331000	20021114

OTHER SOURCE(S): MARPAT 141:9727
ED Entered STN: 11 Jun 2004
AB The laminate has a cathode and an anode on the opposite sides of a cation exchanger membrane, where the membrane has a cathode side film and an anode side film, with the cathode side film having a higher acid group concentration than the anode side film. Preferably, the anode side film is a low mol. weight condensate of a sulfonated alkoxysilane, (R1O)nSi(R2)mR3SO3H [R1 = C≤4 alkyl, R2 = C≥1 organic group, R3 = C≥1 bivalent organic group, n = integer 1-3, m = integer 0-2, and (m+n) =3]; and the cathode side film is a sulfonated fluoropolymer having mol. weight ≥5000.
IT 70942-24-4
(condensation homopolymer; dual cation exchanger electrolyte membranes for fuel cell electrode-electrolyte laminates)
RN 70942-24-4 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (CA INDEX NAME)



IC ICM H01M008-02
ICS H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT Fuel cell electrolytes
(dual cation exchanger electrolyte membranes for fuel cell electrode-electrolyte laminates)
IT 70942-24-4
(condensation homopolymer; dual cation exchanger electrolyte membranes for fuel cell electrode-electrolyte laminates)
IT 163294-14-2, Nafion 112
(dual cation exchanger electrolyte membranes for fuel cell electrode-electrolyte laminates)

L33 ANSWER 15 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2003:707003 HCAPLUS Full-text
DOCUMENT NUMBER: 139:232996
TITLE: Proton conductive membranes with good heat resistance and their production method
INVENTOR(S): Nakamura, Masanori; Mori, Nobuhiro; Nomura, Shigeki
PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003253010	A	20030910	JP 2002-52123	20020227
PRIORITY APPLN. INFO.:			JP 2002-52123	20020227

ED Entered STN: 10 Sep 2003

AB Title membranes comprise (A) three dimensional structures having metal-oxygen bonds, (B) proton conductive materials, (C) short fiber materials, and (D) long fiber materials. Thus, WEA 03C glass fiber plain fabric was immersed in a solution containing 1,8-bis(triethoxysilyl)octane, Tismo N, and tungstophosphoric acid two times, dried at 20° for 15 h, and cured at 60° for 10 h to give a proton conductive membrane with conductivity 8 10-1 S/cm, good heat and pressure difference resistance.

IT 70942-24-4
(proton conductor; preparation of proton conductive membranes with good heat resistance)

RN 70942-24-4 HCAPLUS

CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (CA INDEX NAME)

IC ICM C08J005-04
ICS B01J047-12; C08K003-00; C08K007-04; C08L101-02; H01B001-06; H01B013-00; H01M008-02; H01M008-10

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 40

ST proton conductive membrane heat resistance prepn; glass fiber bistriethoxysilyloctane homopolymer Tismo proton conductive membrane

IT Glass fiber fabrics
(WEA 03C, WEA 05E, Creinforcing materials; preparation of proton conductive membranes with good heat resistance)

IT Silanes
(alkoxy, polymers; preparation of proton conductive membranes with good heat resistance)

IT Nonwoven fabrics
(glass fibers, reinforcing materials; preparation of proton conductive membranes with good heat resistance)

IT Acids, uses
(inorg., proton conductors; preparation of proton conductive membranes with good heat resistance)

IT Synthetic fibers
(potassium titanate, Tismo-N, reinforcing materials; preparation of proton conductive membranes with good heat resistance)

IT Electric conductors
(preparation of proton conductive membranes with good heat resistance)

IT Silsesquioxanes
(preparation of proton conductive membranes with good heat resistance)

IT Polysiloxanes, uses
(preparation of proton conductive membranes with good heat resistance)
IT Heteropoly acids
(proton conductors; preparation of proton conductive membranes with good heat resistance)
IT Crystal whiskers
(reinforcing materials; preparation of proton conductive membranes with good heat resistance)
IT Fibers
Glass fibers, uses
(reinforcing materials; preparation of proton conductive membranes with good heat resistance)
IT Heteropoly acids
(tungstophosphoric, proton conductors; preparation of proton conductive membranes with good heat resistance)
IT Heteropoly acids
(tungstosilicic, proton conductors; preparation of proton conductive membranes with good heat resistance)
IT 503065-10-9P
(preparation of proton conductive membranes with good heat resistance)
IT 11104-88-4, Phosphomolybdic acid 70942-24-4
(proton conductor; preparation of proton conductive membranes with good heat resistance)

L33 ANSWER 16 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2003:697210 HCAPLUS Full-text
DOCUMENT NUMBER: 139:232991
TITLE: Methods for fabrication of flexible electrolyte membrane based on a carrier comprising polymer fibers for fuel cell use
INVENTOR(S): Hennige, Volker; Hying, Christian; Hoerpel, Gerhard
PATENT ASSIGNEE(S): Creavis Gesellschaft fuer Technologie und Innovation m.b.H., Germany
SOURCE: PCT Int. Appl., 72 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003073545	A2	20030904	WO 2003-EP256	20030114
WO 2003073545	A3	20050106		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

DE 10208275	A1	20030904	DE 2002-10208275		20020226
AU 2003248341	A1	20030909	AU 2003-248341		20030114
PRIORITY APPLN. INFO.:			DE 2002-10208275	A	20020226
			WO 2003-EP256	W	20030114

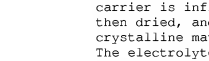
ED Entered STN: 05 Sep 2003

AB The invention relates to a proton-conducting, flexible electrolyte membrane for a fuel cell. The electrolyte membrane is impermeable to the reactants of a fuel cell reaction and comprises a permeable, flexible, open-worked carrier comprising polymer fibers and a proton-conducting material which can selectively conduct protons through the membrane. The invention also relates to a proton -conducting membrane, a method for the production thereof and the use of the same. The inventive membrane represents a novel category of solid, proton-conducting membranes, the base of the membranes being a porous and flexible carrier comprising polymer fibers, preferably a polymer fleece. The carrier is infiltrated with a proton- conducting material, the membrane is then dried, and the proton-conducting material solidifies into a gel or a crystalline material, forming an impermeable, proton- conducting membrane. The electrolyte membrane remains flexible and can easily be used as a membrane in a fuel cell.

IT 70942-24-4 578739-58-9
(methods for fabrication of flexible electrolyte membrane based on carrier comprising polymer fibers for fuel cell use)

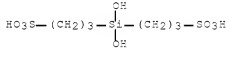
RN 70942-24-4 HCAPLUS

CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (CA INDEX NAME)



RN 578739-58-9 HCAPLUS

CN 1-Propanesulfonic acid, 3,3'-(dihydroxysilylene)bis- (9CI) (CA INDEX NAME)



IC ICM H01M008-02

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

IT 67-56-1, Methanol, uses 78-10-4, Teos 681-84-5, Tmos 762-04-9, Diethyl phosphite 3087-36-3, Titanium ethylate 7585-20-8, Zirconium acetate 9010-39-3, Polytriazole 12789-45-6, Phosphoric acid methyl ester 13590-71-1, Phosphonic acid, monomethyl ester 13746-89-9, Zirconium nitrate 13826-66-9, Zirconium oxynitrate 15477-76-6D, Phosphonate, sulfoaryl derivative 15845-66-6, Phosphonic acid, monoethyl ester 17501-44-9, Zirconium acetylacetonate

31694-16-3 37203-76-2, Phosphoric acid, ethyl ester 40849-91-0, Titanium propylate 42023-31-4, Phosphonic acid, monopropyl ester 52892-19-0, 1-Propanol, Zirconium salt 70942-24-4 77752-07-9, Phosphoric acid, propyl ester 128611-68-7, Oxazole homopolymer 578739-18-1 578739-53-9
(methods for fabrication of flexible electrolyte membrane based on carrier comprising polymer fibers for fuel cell use)
REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 17 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2003:697209 HCAPLUS Full-text
DOCUMENT NUMBER: 139:232990
TITLE: Method for fabrication of flexible electrolyte membrane based on a carrier comprising polymer fibers
INVENTOR(S): Hennige, Volker; Hying, Christian; Hoerpel, Gerhard
PATENT ASSIGNEE(S): Creavis Gesellschaft fuer Technologie und Innovation m.b.H., Germany
SOURCE: PCT Int. Appl., 61 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003073543	A2	20030904	WO 2003-EP1200	20030207
WO 2003073543	A3	20040108		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
DE 10208279	A1	20031023	DE 2002-10208279	20020226
AU 2003248342	A1	20030909	AU 2003-248342	20030207
PRIORITY APPLN. INFO.:			DE 2002-10208279 A	20020226
			WO 2003-EP1200 W	20030207

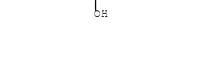
ED Entered STN: 05 Sep 2003
AB The invention relates to a proton-conducting membrane, a method for the production thereof, and the use thereof. The proton-conducting, flexible electrolyte membrane for a fuel cell, which is impermeable to the reaction components used for the fuel cell reaction, comprises a flexible, perforated carrier that is permeable to substances and is provided with polymer fibers. The carrier is interspersed with a proton-conducting material which is suitable to selectively conduct protons through the membrane. The inventive membrane represents a new class of fixed proton -conducting membranes, based on a porous and flexible carrier comprising polymer fibers, preferably a polymer mat. The carrier is infiltrated with a proton-conducting material,

whereupon the membrane is dried and the proton- conducting material is solidified to form a proton- conducting material, preferably a proton- conducting gel, such that ultimately a proton- conducting membrane is obtained, which is impermeable to substances. The electrolyte membrane remains flexible and can be used as a membrane in a fuel cell without any problem.

IT 70942-24-4
(method for fabrication of flexible electrolyte membrane based on carrier comprising polymer fibers)

RN 70942-24-4 HCAPLUS

CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (CA INDEX NAME)



IC ICM H01M008-00

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

IT 9010-39-3, Polytriazole 70942-24-4 128611-68-7, Oxazole homopolymer 438461-55-3 578739-18-1
(method for fabrication of flexible electrolyte membrane based on carrier comprising polymer fibers)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 18 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2003:657076 HCAPLUS Full-text

DOCUMENT NUMBER: 139:182883

TITLE: Method of preparation of zirconium phosphate-based proton-conducting ceramic membranes for use in membrane-electrode assemblies and fuel cells

INVENTOR(S): Hennige, Volker; Hying, Christian; Hoerpel, Gerhard

PATENT ASSIGNEE(S): Creavis Gesellschaft Fuer Technologie Und Innovation m.b.H., Germany

SOURCE: PCT Int. Appl., 38 pp.
CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003069712	A2	20030821	WO 2003-EP163	20030110
WO 2003069712	A3	20040701		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

DE 10205849	A1	20030821	DE 2002-10205849		20020213
AU 2003244864	A1	20030904	AU 2003-244864		20030110
PRIORITY APPLN. INFO.:			DE 2002-10205849	A	20020213
			WO 2003-EP163	W	20030110

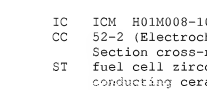
ED Entered STN: 22 Aug 2003

AB The invention relates to proton-conducting ceramic membranes on the basis of zirconium phosphates, methods for the production thereof, and the use thereof in MEAs and fuel cells. The inventive ceramic membranes represent a new class of proton-conducting membranes. In a first step of a special method, nanoscale zirconium phosphate is produced in a microjet reactor. The material is then applied on a flexible carrier as a suspension and solidified, whereby a cation/ proton-conducting membrane is obtained which is impermeable for materials, flexible and can be used in a fuel cell without any problem.

IT 70942-24-4
(method of preparation of zirconium phosphate-based proton-conducting ceramic membranes for use in membrane-electrode assemblies and fuel cells)

RN 70942-24-4 HCAPLUS

CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (CA INDEX NAME)



IC ICM H01M008-10

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57

ST fuel cell zirconium phosphate based proton conducting ceramic membrane

IT Synthetic fibers
(aluminum nitride oxide silicide; method of preparation of zirconium phosphate-based proton-conducting ceramic membranes for use in membrane-electrode assemblies and fuel cells)

IT Synthetic fibers
(aluminum nitride; method of preparation of zirconium phosphate-based proton-conducting ceramic membranes for use in membrane-electrode assemblies and fuel cells)

IT Synthetic fibers
(aluminum oxide; method of preparation of zirconium phosphate-based proton-conducting ceramic membranes for use in membrane-electrode assemblies and fuel cells)

IT Synthetic fibers
(boron nitride; method of preparation of zirconium phosphate-based proton-conducting ceramic membranes for use in membrane-electrode assemblies and fuel cells)

IT Fuel cells
(direct-methanol; method of preparation of zirconium phosphate-based

proton-conducting ceramic membranes for
use in membrane-electrode assemblies and fuel cells)
IT Ceramic membranes
Fuel cell electrodes
Fuel cell electrolytes
(method of preparation of zirconium phosphate-based proton-
conducting ceramic membranes for use in
membrane-electrode assemblies and fuel cells)
IT Phosphates, processes
(method of preparation of zirconium phosphate-based proton-
conducting ceramic membranes for use in
membrane-electrode assemblies and fuel cells)
IT Glass fibers, uses
(method of preparation of zirconium phosphate-based proton-
conducting ceramic membranes for use in
membrane-electrode assemblies and fuel cells)
IT Halides
Phosphorus acids
(method of preparation of zirconium phosphate-based proton-
conducting ceramic membranes for use in
membrane-electrode assemblies and fuel cells)
IT Synthetic fibers
(silica; method of preparation of zirconium phosphate-based
proton-conducting ceramic membranes for
use in membrane-electrode assemblies and fuel cells)
IT Synthetic fibers
(silicon nitride; method of preparation of zirconium phosphate-based
proton-conducting ceramic membranes for
use in membrane-electrode assemblies and fuel cells)
IT Fuel cells
(solid electrolyte; method of preparation of zirconium phosphate-based
proton-conducting ceramic membranes for
use in membrane-electrode assemblies and fuel cells)
IT Semiconductor materials
(sols; method of preparation of zirconium phosphate-based proton
-conducting ceramic membranes for use in
membrane-electrode assemblies and fuel cells)
IT Metals, uses
(sols; method of preparation of zirconium phosphate-based proton
-conducting ceramic membranes for use in
membrane-electrode assemblies and fuel cells)
IT Synthetic fibers
(zirconia; method of preparation of zirconium phosphate-based
proton-conducting ceramic membranes for
use in membrane-electrode assemblies and fuel cells)
IT 1344-28-1, Aluminum oxide (Al2O3), uses
(fiber; method of preparation of zirconium phosphate-based
proton-conducting ceramic membranes for
use in membrane-electrode assemblies and fuel cells)
IT 1314-23-4, Zirconia, uses 10043-11-5, Boron nitride BN, uses
12033-89-5, Silicon nitride (Si3N4), uses 24304-00-5, Aluminum
nitride aln 51184-13-5, Sialon 140418-43-5, Boron nitride b0-1n0-1
(fibers; method of preparation of zirconium phosphate-based
proton-conducting ceramic membranes for
use in membrane-electrode assemblies and fuel cells)
IT 78-10-4, Teos 78-38-6, Diethylethyl phosphonate 598-02-7, Diethyl
phosphate 681-84-5, Tmos 1343-98-2, Silicic acid 3087-36-3,
Titanium ethylate 7440-67-7D, Zirconium, alcoholate 7585-20-8,
Zirconium acetate 7664-38-2, Phosphoricacid, processes 11126-30-0,
Zirconium chloride 12789-45-6, Phosphoric acid methyl ester

13746-89-9, Zirconium nitrate 16024-58-1 17501-44-9, Zirconium acetylacetonate 40849-91-0, Titanium propylate 70942-24-4 578739-18-1
(method of preparation of zirconium phosphate-based proton-conducting ceramic membranes for use in membrane-electrode assemblies and fuel cells)

IT 13765-95-2, Zirconium phosphate
(method of preparation of zirconium phosphate-based proton-conducting ceramic membranes for use in membrane-electrode assemblies and fuel cells)

IT 139-12-8, Aluminum acetate 7429-90-5D, Aluminum, alc. compound 7440-21-3D, Silicon, acetylacetonate complex 7440-21-3D, Silicon, alc. compound 7440-32-6D, Titanium, alc. compound 7440-67-7D, Zirconium, alc. compound 7601-90-3, Perchloricacid, uses 7647-01-0, Hydrochloric acid, uses 7664-93-9, Sulfuric acid, uses 7697-37-2, Nitric acid, uses 7782-99-2, Sulfurous acid, uses 13473-90-0, Aluminum nitrate 13860-02-1, Titanium nitrate 13963-57-0, Aluminum acetylacetonate 14284-96-9 14455-29-9, Aluminum carbonate 36577-48-7, Zirconium carbonate 38497-57-3, Titanium acetate 76214-28-3, Titanium carbonate
(method of preparation of zirconium phosphate-based proton-conducting ceramic membranes for use in membrane-electrode assemblies and fuel cells)

IT 67-56-1, Methanol, uses 1299-86-1, Aluminum carbide 7631-86-9, Silica, uses 11116-16-8, Titanium nitride 12070-08-5, Titanium carbide 12070-14-3, Zirconium carbide (ZrC) 13463-67-7, Titanium oxide, uses 107992-37-0, Silicon carbide (Si0-1C0-1) 119173-61-4, Zirconium nitride
(method of preparation of zirconium phosphate-based proton-conducting ceramic membranes for use in membrane-electrode assemblies and fuel cells)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 19 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2003:657075 HCAPLUS Full-text
DOCUMENT NUMBER: 139:182882
TITLE: Method of preparation of flexible electrolyte based on a glass fabric for fuel cell
INVENTOR(S): Hennige, Volker; Hoerpel, Gerhard; Hying, Christian
PATENT ASSIGNEE(S): Creavis Gesellschaft Fuer Technologie Und Innovation m.b.H., Germany
SOURCE: PCT Int. Appl., 59 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003069711	A2	20030821	WO 2003-EP162	20030110
WO 2003069711	A3	20050120		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ,

TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

DE 10205850	A1	20030821	DE 2002-10205850		20020213
AU 2003244862	A1	20030904	AU 2003-244862		20030110
PRIORITY APPLN. INFO.:			DE 2002-10205850	A	20020213
			WO 2003-EP162	W	20030110

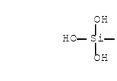
ED Entered STN: 22 Aug 2003

AB The invention relates to a proton-conducting membrane and to a method for the production and utilization thereof. The proton-conducting, flexible electrolyte membrane for a fuel cell, which is impervious for reaction components, includes a flexible, perforated carrier that is permeable to substances and comprises a glass, wherein the carrier is permeated with a gel suitable for selectively conducting protons through the membrane. The inventive membrane represents a novel class of solid, proton-conducting membranes, the base thereof being a porous and flexible carrier made of glass. The carrier is infiltrated with a proton-conducting material, the membrane is then dried and the proton-conducting material is solidified into a gel so that a proton-conducting membrane permeable to substances is finally obtained. The electrolyte membrane remains flexible and can be used without any problems as membrane in a fuel cell.

IT 70942-24-4 578739-58-9
(method of preparation of flexible electrolyte based on glass fabric for fuel cell)

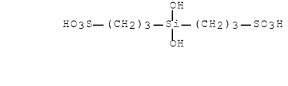
RN 70942-24-4 HCAPLUS

CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (CA INDEX NAME)



RN 578739-58-9 HCAPLUS

CN 1-Propanesulfonic acid, 3,3'-(dihydroxysilylene)bis- (9CI) (CA INDEX NAME)



IC ICM H01M008-10

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57

IT 7601-90-3, Perchloric acid, uses 7647-01-0, Hydrochloric acid, uses 7664-38-2, Phosphoricacid, uses 7664-93-9, Sulfuric acid, uses

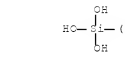
7697-37-2, Nitric acid, uses 7782-99-2, Sulfurous acid, uses
9010-39-3, Polytriazole 13598-36-2, Phosphonic acid
40942-24-4 128611-68-7, Oxazole homopolymer 578739-18-1
578739-58-9
(method of preparation of flexible electrolyte based on glass fabric for fuel cell)
REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 20 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2003:657073 HCAPLUS Full-text
DOCUMENT NUMBER: 139:199955
TITLE: Method of fabrication of electrolyte membrane comprising a diffusion barrier and membrane electrode units for fuel cells
INVENTOR(S): Hennige, Volker; Hying, Christian; Hoerpel, Gerhard
PATENT ASSIGNEE(S): Creavis Gesellschaft Fuer Technologie Und Innovation m.b.H., Germany
SOURCE: PCT Int. Appl., 70 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2003069708	A2	20030821	WO 2003-EP169	20030110
WO 2003069708	A3	20031231		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
DE 10205852	A1	20030821	DE 2002-10205852	20020213
AU 2003205588	A1	20030904	AU 2003-205588	20030110
PRIORITY APPLN. INFO.:			DE 2002-10205852 A	20020213
			WO 2003-EP169 W	20030110

ED Entered STN: 22 Aug 2003
AB The invention relates to a proton conducting membrane, to a method for the production thereof and to the use of the same. The inventive membrane represents a novel class of proton conducting membranes, which can be used, in particular, in fuel cells. The disadvantage associated with conventional proton conducting membranes , which are based on a porous, flexible ceramic membrane is that the electrolyte is washed out of membranes of this type by water or methanol. The inventive membranes comprise a coating that is insol. in water and methanol as the diffusion barrier, the coating preventing the electrolyte from being washed out by the water or methanol. The electrolyte membranes can be configured in a flexible manner and can be used without problems as the membrane in a fuel cell.

IT 70942-24-4
(method of fabrication of electrolyte membrane comprising diffusion barrier and membrane electrode units for fuel cells)
RN 70942-24-4 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (CA INDEX NAME)



IC ICM H01M008-02
ICS H01M002-16
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57
IT Composites
(polymers, with inorg. proton conductors; method of fabrication of electrolyte membrane comprising diffusion barrier and membrane electrode units for fuel cells)
IT 67-56-1, Methanol, uses 409-21-2, Silicon carbide sic, uses 1314-23-4, Zirconium oxide, uses 1314-56-3, Phosphorus oxide, uses 1344-28-1, Aluminum oxide, uses 7601-90-3, Perchloric acid, uses 7631-86-9, Silicon oxide, uses 7647-01-0, Hydrochloric acid, uses 7664-38-2, Phosphoric acid, uses 7664-93-9, Sulfuric acid, uses 7697-37-2, Nitric acid, uses 7782-99-2, Sulfurous acid, uses 12033-89-5, Silicon nitride, uses 13463-67-7, Titanium oxide, uses 21006-68-8, Titanium phosphonate 70942-24-4 438461-55-3 578739-18-1
(method of fabrication of electrolyte membrane comprising diffusion barrier and membrane electrode units for fuel cells)
REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 21 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2002:778353 HCAPLUS Full-text
DOCUMENT NUMBER: 137:297412
TITLE: Electrolyte membrane, membrane electrode units comprising the same, method for the production thereof and specific uses therefor
INVENTOR(S): Hennige, Volker; Hoerpel, Gerhard; Hying, Christian
PATENT ASSIGNEE(S): Creavis Gesellschaft fuer Technologie und Innovation mbH, Germany
SOURCE: PCT Int. Appl., 57 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002080297	A2	20021010	WO 2002-EP1550	20020214
WO 2002080297	A3	20030220		

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH,

CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

DE 10115928	A1	20021010	DE 2001-10115928		20010330
AU 2002229750	A1	20021015	AU 2002-229750		20020214
PRIORITY APPLN. INFO.:			DE 2001-10115928	A	20010330
			WO 2002-EP1550	W	20020214

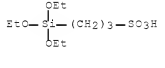
ED Entered STN: 11 Oct 2002

AB The invention relates to a p-conductive, flexible electrolyte membrane for a fuel cell, which is impermeable to the reaction components of the fuel-cell reaction. Said membrane comprises a composite material that is permeable to substances and that consists of a flexible, perforated support comprising a glass, in addition to a porous ceramic material. The composite material is interspersed with a p-conductive material, which is suitable for selectively conducting protons through the membrane.

IT 260784-99-4
(coatings; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

RN 260784-99-4 HCAPLUS

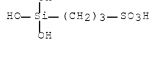
CN 1-Propanesulfonic acid, 3-(triethoxysilyl)- (CA INDEX NAME)



IT 70942-24-4
(proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

RN 70942-24-4 HCAPLUS

CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (CA INDEX NAME)



IC ICM H01M008-10
ICS H01M008-02; H01M004-88

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 48, 57, 72

ST proton conducting composite ceramic

membrane electrolyte electrode fabrication

IT Synthetic fibers
(aluminum oxide, support; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT Aluminoborosilicate glasses
(calcium magnesium aluminoborosilicate, support; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT Membranes, nonbiological
(composite; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT Soot
(conductive catalyst support; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT Coal, uses
Oxides (inorganic), uses
(conductive catalyst support; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT Ceramics
(fibers, polycryst., support; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT Aluminosilicate glasses
(magnesium aluminosilicate, support; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT Transition metal complexes
(phthalocyanine; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT Ceramics
(porous; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT Fuel cell separators
Ionic liquids
Membrane electrodes
(proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT Glass powders
Ultrastable Y zeolites
Y zeolites
(proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT Bronsted acids
(proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT Ceramic membranes
(support; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT Fluoropolymers, uses
(support; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT Metallophthalocyanines
(transition metal complexes; proton-conducting

flexible electrolyte membranes with ceramic support for fuel cells)

IT 7440-44-0, Activated carbon, uses
(activated, conductive catalyst support; proton-conducting flexible electrolyte membranes for fuel cell electrode)

IT 1344-28-1, Aluminum oxide, uses
(ceramic fibers; proton-conducting flexible electrolyte membranes for fuel cell electrode)

IT 1314-23-4, Zirconium oxide, uses 7429-90-5D, Aluminum, alkoxides, hydrolyzed 7440-62-2D, Vanadium, alkoxides, hydrolyzed 26978-93-4
(coatings; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT 7631-86-9, Levasil 200, uses
(colloidal, proton-conducting material precursor; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT 7782-42-5, Graphite, uses
(conductive catalyst support; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT 3087-36-3D, Titanium ethoxide, hydrolyzed 7446-70-0D, Aluminum trichloride, hydrolyzed
(din preparation of compound for p-conducting fuel cell membrane)

IT 65039-09-0, 1H-Imidazolium, 1-ethyl-3-methyl-chloride 79917-90-1, 1-n-Butyl-3-methylimidazolium-chloride 132086-91-0, 1H-Imidazolium, 1-ethyl-3-methyl-, chloride, mixture with aluminum chloride (AlCl3) 143314-14-1, 1H-Imidazolium, 1-ethyl-3-methyl-, nitrate 143314-15-2, 1H-Imidazolium, 1-ethyl-3-methyl-, nitrite 143314-16-3, 1H-Imidazolium, 1-ethyl-3-methyl-,tetrafluoroborate(1-) 145022-44-2 174899-65-1, 1H-Imidazolium, 1-ethyl-3-methyl-, salt with trifluoroacetic acid (1:1) 174899-82-2, 1H-Imidazolium, 1-ethyl-3-methyl-, salt with 1,1,1-trifluoro-N-[(trifluoromethyl)sulfonyl]methanesulfonamide (1:1)
(ionic liquid; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT 506-87-6, Ammonium carbonate 1066-33-7, Ammonium bicarbonate
(pore forming agent; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT 7440-02-0D, Nickel, complexes 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-18-8, Ruthenium, uses 7440-48-4D, Cobalt, complexes 16941-12-1, Hexachloro platinic acid
(proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT 546-68-9D, Titanium tetraisopropylate, hydrolyzed
(proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

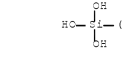
IT 78-10-4D, Tetraethoxy silane, hydrolyzed 78-38-6, Diethyl ethyl phosphonate 555-31-7D, Aluminum triisopropylate, hydrolyzed 681-84-5, TMOS 762-04-9, Diethyl phosphite 1314-62-1, Vanadium oxide (V2O5), uses 1332-29-2, Tin Oxide 2031-67-6, Methyl triethoxy silane 2171-98-4D, Zirconium isopropylate, hydrolyzed 3087-37-4D, Tetrapropoxytitanium, hydrolyzed 7585-20-8 7699-41-4, Silicic acid (H2SiO3) 10049-08-8, Ruthenium chloride 12789-45-6,

Phosphoric acid methyl ester 13463-67-7, Titania, uses 13826-66-9, Zirconium oxynitrate 17501-44-9, Zirconium acetylacetonate 23519-77-9, Zirconium tetrapropylate 70942-24-4 432545-16-9, Tungsten hydroxide oxide silicate (W3(OH)4O2(SiO4)) 438461-54-2 438461-55-3
(proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT 2031-67-6D, Methyltriethoxysilane, hydrolyzed
(proton-conducting material precursor; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT 13746-89-9, Zirconium nitrate
(sol, proton-conducting material precursor; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT 9002-84-0, PTFE
(support; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 22 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2002:778352 HCAPLUS Full-text
DOCUMENT NUMBER: 137:297411
TITLE: Description, fabrication and applications of proton conducting electrolyte membranes and membrane electrodes
INVENTOR(S): Hennige, Volker; Hoerpel, Gerhard; Hying, Christian
PATENT ASSIGNEE(S): Creavis Gesellschaft fuer Technologie und Innovation mbH, Germany
SOURCE: PCT Int. Appl., 57 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002080296	A2	20021010	WO 2002-EP1549	20020214
WO 2002080296	A3	20050407		
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
DE 10115927	A1	20021010	DE 2001-10115927	20010330
AU 2002246091	A1	20021015	AU 2002-246091	20020214
PRIORITY APPLN. INFO.:			DE 2001-10115927 A	20010330
			WO 2002-EP1549 W	20020214

OTHER SOURCE(S): MARPAT 137:297411
ED Entered STN: 11 Oct 2002
AB A proton-conducting, flexible electrolyte membrane for a fuel cell, which is impermeable for the reactants of a fuel-cell reaction, is described. The membrane is a permeable composite material which has a flexible, perforated, ceramic-containing support. The composite material is impregnated with a proton-conductive material that selectively conducts protons through the membrane.
IT 70942-24-4, Si 285
(coatings; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
RN 70942-24-4 HCAPLUS
CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (CA INDEX NAME)



IC ICM H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST electrolyte electrode proton conducting composite ceramic membrane fabrication
IT Zeolite HY
(Zeolyst CBV 600; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT Synthetic fibers
(aluminum oxide, support; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT Carbon black, uses
Coal, uses
(catalyst support; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT Ceramics
(fibers, polycryst., supports; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT Ceramics
(porous, support; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT Fuel cell separators
Ionic liquids
Membrane electrodes
(proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT Bronsted acids
(proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT Y zeolites
(proton-conducting material precursor; proton-conducting flexible electrolyte

membranes with ceramic support for fuel cells)
IT Ionic conductors
(protonic; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT Ceramic membranes
(support; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT Heteropoly acids
(tungstosilicic; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT 12651-23-9, Titanium hydroxide
(S 500-300, proton-conducting material precursor; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT 7440-44-0, Carbon, uses 7782-42-5, Graphite, uses
(catalyst support; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT 574-93-6D, Phthalocyanine, metal complexes 7440-02-0, Nickel, uses 7440-05-3, Palladium, uses 7440-06-4, Platinum, uses 7440-18-8, Ruthenium, uses 7440-48-4, Cobalt, uses 16941-12-1, Hexachloroplatinic acid
(catalyst; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT 1344-28-1, Aluminum oxide, uses
(ceramic fibers; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT 409-21-2, Silicon carbide, uses 12033-89-5, Silicon nitride, uses
(ceramic; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT 1314-23-4, Zirconium oxide, uses 7429-90-5D, Aluminum, alkoxides, hydrolyzed 7440-62-2D, Vanadium, alkoxides, hydrolyzed 70942-24-4, Si 285
(coatings; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT 7631-86-9, Levasil 200, uses
(colloidal, proton-conducting material precursor; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT 506-87-6, Ammonium carbonate 1066-33-7, Ammonium bicarbonate
(pore former; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT 78-38-6, Diethyl ethylphosphonate
(proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)
IT 78-10-4, Tetraethyl orthosilicate 512-56-1, Methyl phosphate 681-84-5, Tetramethyl orthosilicate 762-04-9, Diethyl phosphite 1332-29-2, Tin oxide 2031-67-6, Methyl triethoxy silane 2171-98-4, Zirconium isopropylate 7446-70-0D, Aluminum chloride, hydrolyzed 7578-04-3, Tributylmethylammonium p-toluenesulfonate 7585-20-8,

Zirconium acetate 7601-90-3, Perchloric acid, uses 7647-01-0, Hydrochloric acid, uses 7664-38-2, Phosphoric acid, uses 7664-93-9, Sulfuric acid, uses 7697-37-2, Nitric acid, uses 7782-99-2, Sulfurous acid, uses 12067-99-1, Tungstophosphoric acid 13598-36-2, Phosphonic acid 13765-95-2 13826-66-9, Zirconium oxynitrate 17501-44-9, Zirconium acetylacetonate 65039-09-0, 1-Ethyl-3-methylimidazolium chloride 79917-88-7, 1,3-Dimethylimidazolium chloride 79917-90-1, 1-Butyl-3-methylimidazolium chloride 80432-05-9 105541-66-0, Octyltriphenylphosphonium p-toluenesulfonate 143314-14-1 143314-15-2 143314-16-3, 1-Ethyl-3-methylimidazolium tetrafluoroborate 145022-44-2, 1-Ethyl-3-methylimidazolium trifluoromethanesulfonate 174899-65-1 174899-66-2, 1-Butyl-3-methylimidazolium trifluoromethanesulfonate 174899-82-2 438461-55-3 469910-77-8 469910-78-9
(proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT 78-10-4D, Tetraethoxysilane, hydrolyzed 546-68-9D, Titanium tetraisopropylate, hydrolyzed 555-31-7D, Aluminum triisopropylate, hydrolyzed 1314-62-1, Vanadium pentoxide, uses 1343-98-2, Silicic acid 2031-67-6D, Methyltriethoxysilane, hydrolyzed 2171-98-4D, Tetraisopropoxyzirconium, hydrolyzed 3087-36-3D, TetraethoxyTitanium, hydrolyzed 10049-08-8, Ruthenium chloride 13463-67-7, Degussa P25, uses
(proton-conducting material precursor; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

IT 13746-89-9, Zirconium nitrate
(sol, proton-conducting material precursor; proton-conducting flexible electrolyte membranes with ceramic support for fuel cells)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 23 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2002:465869 HCAPLUS Full-text
DOCUMENT NUMBER: 137:49666
TITLE: Cation-conducting or proton-conducting ceramic fuel cell membranes based on an immobilized hydroxysilyl-substituted silicic or phosphonic acid
INVENTOR(S): Hennige, Volker; Hying, Christian; Hoerpel, Gerhard
PATENT ASSIGNEE(S): Creavis Gesellschaft fuer Technologie und Innovation m.b.H., Germany
SOURCE: PCT Int. Appl., 26 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: German
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002047801	A1	20020620	WO 2001-EP12466	20011027
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ,				

NO, NZ, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

DE 10061920	A1	20020620	DE 2000-10061920	20001213
CA 2431055	A1	20020620	CA 2001-2431055	20011027
AU 2002021771	A	20020624	AU 2002-21771	20011027
EP 1345674	A1	20030924	EP 2001-270377	20011027
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
JP 2004515896 T		20040527	JP 2002-549366	20011027
US 20040028913 A1		20040212	US 2003-450247	20030612
NO 2003002719 A		20030613	NO 2003-2719	20030613

PRIORITY APPLN. INFO.: DE 2000-10061920 A 20001213
WO 2001-EP12466 W 20011027

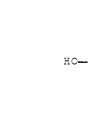
ED Entered STN: 21 Jun 2002

AB Solid proton-conducting and cation- conducting ceramic membranes are based on a porous and flexible ceramic base membrane that is impregnated by a proton-conducting material, dried, and consolidated in such a way to form an impermeable conducting membrane, especially for fuel cells. The proton-conducting substance is a hydroxysilyl-substituted phosphonic acid or sulfonic acid that is immobilized into an inorg. network (e.g., SiO2). The hydroxysilyl-substituted proton conductor, or its precursors, are organosilicon compds. of structures [(RO)y(R2)zSi-(R1-SO3-)a]xMx+, or [(RO)y(R2)zSi-{R1ObP(OcR3)O2}a]xMx+, in which R1 = C1-12-alkyl, C1-12-alkenyl, C5-8-cycloalkyl, -(CH2)n-c-C6H10-(CH2)m.-, or -(CH2)n-C6H4-(CH2)m-; n, m = 0-6; M = H+, NH4+, or a metal cation of valence x (=1-4); y = 1-3, z = 0-2, a = 1-3; z + y = 4 - a; b,c = 0 or 1; R1,R2 = H, Me, Et, Pr, or Bu; and R3 = Me, Et, Pr, or Bu.

IT 70942-24-4, 1-Propanesulfonic acid, 3-(trihydroxysilyl)-
(silicic acid precursor; in synthesis of cation-conducting or proton-conducting ceramic fuel cell membranes based on an immobilized hydroxysilyl-substituted silicic or phosphonic acid)

RN 70942-24-4 HCAPLUS

CN 1-Propanesulfonic acid, 3-(trihydroxysilyl)- (CA INDEX NAME)



IC ICM B01D071-02
ICS B01D071-04; B01D069-14

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 48, 57, 72

ST proton conducting ceramic membrane fuel cell; cation conducting ceramic membrane fuel cell; immobilized hydroxysilyl sulfonate phosphonate proton conducting membrane

IT Ceramic membranes
(composite; cation-conducting or proton-

conducting ceramic fuel cell membranes based on an immobilized hydroxysilyl-substituted silicic or phosphonic acid)

IT Aluminosilicates, uses
Heteropoly acids
Minerals, uses
Polymers, uses
Zeolites (synthetic), uses
(matrix, composite membranes containing; cation-conducting or proton-conducting ceramic fuel cell membranes based on an immobilized hydroxysilyl-substituted silicic or phosphonic acid)

IT Glass, uses
(membranes; cation-conducting or proton-conducting ceramic fuel cell membranes based on an immobilized hydroxysilyl-substituted silicic or phosphonic acid)

IT Sulfonic acids, uses
(organosilyl derivs., reactions of; in synthesis of cation-conducting or proton-conducting ceramic fuel cell membranes based on an immobilized hydroxysilyl-substituted silicic or phosphonic acid)

IT Ionic conductors
(proton, composite membranes; cation-conducting or proton-conducting ceramic fuel cell membranes based on an immobilized hydroxysilyl-substituted silicic or phosphonic acid)

IT Fuel cell separators
(proton-conducting; cation-conducting or proton-conducting ceramic fuel cell membranes based on an immobilized hydroxysilyl-substituted silicic or phosphonic acid)

IT Semimetals
(reactions of; in synthesis of cation-conducting or proton-conducting ceramic fuel cell membranes based on an immobilized hydroxysilyl-substituted silicic or phosphonic acid)

IT Heteropoly acids
(tungstophosphates, reactions of; in synthesis of cation-conducting or proton-conducting ceramic fuel cell membranes based on an immobilized hydroxysilyl-substituted silicic or phosphonic acid)

IT 12173-98-7P, Mordenite
(matrix, composite membranes containing; cation-conducting or proton-conducting ceramic fuel cell membranes based on an immobilized hydroxysilyl-substituted silicic or phosphonic acid)

IT 7601-90-3, Perchloric acid, processes 7664-93-9, Sulfuric acid, processes
(peptizing and precipitation agent; in synthesis of cation-conducting or proton-conducting ceramic fuel cell membranes based on an immobilized hydroxysilyl-substituted silicic or phosphonic acid)

IT 1314-23-4, Zirconia, uses 1314-56-3, Phosphorus oxide (P2O5), uses 1344-28-1, Alumina, uses 7631-86-9, Silica, uses 8049-20-5, Mischmetal 12712-36-6, Antimonic acid 13463-67-7, Titanium dioxide, uses 13598-36-2D, Phosphonic acid, organosilyl derivs. 19114-77-3
(reactions of; in synthesis of cation-conducting or proton-conducting ceramic fuel cell membranes based on an immobilized hydroxysilyl-substituted silicic or phosphonic acid)

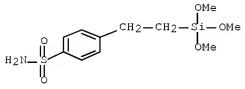
IT 78-10-4, Tetraethylorthosilicate 681-84-5, Tetramethylorthosilicate

2171-98-4, Zirconium tetraisopropoxide
(reactions of; in synthesis of cation-conducting or proton-conducting ceramic fuel cell membranes based on an immobilized hydroxysilyl-substituted silicic or phosphonic acid)
IT 70942-24-4, 1-Propanesulfonic acid, 3-(trihydroxysilyl)- 438461-54-2 438461-55-3
(silicic acid precursor; in synthesis of cation-conducting or proton-conducting ceramic fuel cell membranes based on an immobilized hydroxysilyl-substituted silicic or phosphonic acid)
REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 24 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2000:70498 HCAPLUS Full-text
DOCUMENT NUMBER: 132:208398
TITLE: Proton conducting sulfone/sulfonamide functionalized materials based on inorganic-organic matrices
AUTHOR(S): Depre, Laurent; Ingram, Malcolm; Poinsignon, Christiane; Popall, Michael
CORPORATE SOURCE: Fraunhofer Institut fur Silicatforschung, Wurzburg, D-97082, Germany
SOURCE: Electrochimica Acta (2000), 45(8-9), 1377-1383
CODEN: ELCAAV; ISSN: 0013-4686
PUBLISHER: Elsevier Science Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 30 Jan 2000
AB A new class of inorg.-organic protonic polymer electrolyte was developed recently by grafting sulfonic and sulfonamide groups to the inorg. network by the sol-gel route. It assocs. the mech. and thermal resistance of the silica backbone to the chemical reactivity induced by the organic chains grafted to the silica network. The organic chains are slightly acidic proton conductors bearing sulfonic and sulfonamide groups. The polycondensation of alkoxysilanes provides the inorg. silica backbone whereas the organic network is formed from reactive functional groups R' of alkoxysilanes of the type R'Si(OR)3, or by copolymn. of reactive organic monomers with functionalized alkoxysilanes. The synthesis of the resins is completed by organic crosslinking reactions (thermal or UV-curing). The transport of the protons through the solid could be described as a mechanism in which the proton was transferred from a donor (sulfonic group) to a suitable placed acceptor (e.g. sulfonamide group) in the case of a dry material. The conductivity was also studied as a function of relative humidity (r.h.) (wet proton conductors). Here, the proton transport could be described as a vehicular mechanism where the proton rides on a carrier mol. (H_3O^+). Furthermore the conductivity dependence on temperature follows a VTF behavior. By increasing the water content of the membranes up to 16 mass%, the conductivity increases from 10-4 to 6 + 10-2 S cm-1 at 70°C. These materials will be developed for thin film batteries. Their mech. properties, thermal stability and glass transition temperature are discussed in connection with the conductivity results.
IT 260785-01-1P 260785-02-2P
(sol-gel processed; preparation and characterization of proton conducting sulfone/sulfonamide functionalized materials based on inorg.-organic matrixes)
RN 260785-01-1 HCAPLUS
CN 1-Propanesulfonic acid, 3-(triethoxysilyl)-, polymer with 4-[2-(trimethoxysilyl)ethyl]benzenesulfonamide (9CI) (CA INDEX NAME)

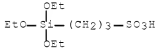
CM 1

CRN 260785-00-0
CMF C11 H19 N O5 S Si



CM 2

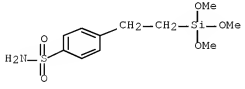
CRN 260784-99-4
CMF C9 H22 O6 S Si



RN 260785-02-2 HCAPLUS
CN 1-Propanesulfonic acid, 3-(triethoxysilyl)-, polymer with dimethoxymethyl[3-(oxiranylmethoxy)propyl]silane and 4-[2-(trimethoxysilyl)ethyl]benzenesulfonamide (9CI) (CA INDEX NAME)

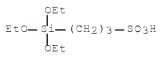
CM 1

CRN 260785-00-0
CMF C11 H19 N O5 S Si



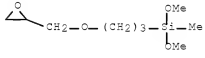
CM 2

CRN 260784-99-4
CMF C9 H22 O6 S Si



CM 3

CRN 65799-47-5
CMF C9 H20 O4 Si



CC 36-5 (Physical Properties of Synthetic High Polymers)
Section cross-reference(s): 72, 76
ST proton conducting sulfone sulfonamide polymer electrolyte
IT Ceramers
Conducting polymers
Cyclic voltammetry
Electric impedance
Glass transition temperature
Polymer electrolytes
Primary batteries
Secondary batteries
Thermal stability
(preparation and characterization of proton conducting sulfone/sulfonamide functionalized materials based on inorg.-organic matrixes)
IT Ionic conductivity
(proton; preparation and characterization of proton conducting sulfone/sulfonamide functionalized materials based on inorg.-organic matrixes)
IT 7440-05-3, Palladium, uses 12648-42-9, Palladium hydride
(ORMOCER systems, electrolyte cell; preparation and characterization of proton conducting sulfone/sulfonamide functionalized materials based on inorg.-organic matrixes)
IT 1313-13-9, Manganese oxide (MnO2), properties
(ORMOCER systems, electrolyte cell; preparation and characterization of proton conducting sulfone/sulfonamide functionalized materials based on inorg.-organic matrixes)
IT 7732-18-5, Water, uses
(absorption; preparation and characterization of proton conducting sulfone/sulfonamide functionalized materials based on inorg.-organic matrixes)
IT 106-95-6, Allyl bromide, reactions 998-30-1, Triethoxysilane
(preparation and characterization of proton conducting sulfone/sulfonamide functionalized materials based on inorg.-organic

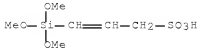
matrixes)
IT 2495-39-8P, Sodium allyl sulfonate 14418-84-9P, 2-Propene-1-sulfonyl chloride 16325-51-2P, Allyl sulfonamide 260784-97-2P
(preparation and characterization of proton conducting sulfone/sulfonamide functionalized materials based on inorg.-organic matrixes)
IT 260784-98-3P
(preparation and characterization of proton conducting sulfone/sulfonamide functionalized materials based on inorg.-organic matrixes)
IT 260785-01-1P 260785-02-2P 260785-03-3P
(sol-gel processed; preparation and characterization of proton conducting sulfone/sulfonamide functionalized materials based on inorg.-organic matrixes)
REFERENCE COUNT: 18 THERE ARE 18 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L33 ANSWER 25 OF 25 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 1998:358415 HCAPLUS Full-text
DOCUMENT NUMBER: 129:123113
ORIGINAL REFERENCE NO.: 129:25226h,25227a
TITLE: Inorganic-organic proton conductors based on alkylsulfone functionalities and their patterning by photoinduced methods
AUTHOR(S): Depre, Laurent; Kappel, Jurgen; Popall, Michael
CORPORATE SOURCE: Fraunhofer-Inst. Silicatforschung, Wurzburg, D-97082, Germany
SOURCE: Electrochimica Acta (1998), 43(10-11), 1301-1306
CODEN: ELCAAV; ISSN: 0013-4686
PUBLISHER: Elsevier Science Ltd.
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 13 Jun 1998
AB An inorg.-organic proton conducting polymer electrolyte (ORMOCER) is presented which may be used in batteries, electrochromic windows, displays and fuel cells. This new class of material, consisting of an interconnected network of inorg. oxide and organic components, prepared by sol-gel processing is used to form coatings and membranes. Alkylsulfone alkoxysilanes were synthesized in order to provide the expected proton conductors. Cocondensation with reactive polymerizable alkoxysilanes results in oxidic oligomers which can be organically crosslinked via UV-initiated and/or thermal polymerization The material exhibits a proton conductivity of 10-2 Ω-1 cm-1 at room temperature, a thermal stability of the amorphous network up to 180°C, optical transparency and chemical stability. The materials were patterned by laser writing and photolithog.
IT 210160-22-8P
(preparation of inorg.-organic proton conductors from trimethoxysilanes and tetraethoxysilane by sol-gel processing and their patterning by photoinduced methods)
RN 210160-22-8 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 3-(trimethoxysilyl)propyl ester, polymer with silicic acid (H4SiO4) tetraethyl ester, trimethoxy[3-(oxiranylmethoxy)propyl]silane and 3-(trimethoxysilyl)-2-propene-1-sulfonic acid (9CI) (CA INDEX NAME)

CM 1

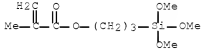
CRN 210160-21-7

CMF C6 H14 O6 S Si



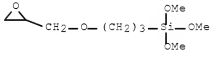
CM 2

CRN 2530-85-0
CMF C10 H20 O5 Si



CM 3

CRN 2530-83-8
CMF C9 H20 O5 Si



CM 4

CRN 78-10-4
CMF C8 H20 O4 Si

CC 37-3 (Plastics Manufacture and Processing)
Section cross-reference(s): 38, 52, 73, 74
ST sulfone alkoxysilane polymer proton conductor; sol

gel processing alkoxysilane polymer; cond proton alkoxysilane polymer sol gel; laser writing alkoxysilane polymer sol gel; photolithog alkoxysilane polymer sol gel

IT Conducting polymers
Photolithography
Polymer morphology
Sol-gel processing
(preparation of inorg.-organic proton conductors from trimethoxysilanes and tetraethoxysilane by sol-gel processing and their patterning by photoinduced methods)

IT Ionic conductivity
(proton; preparation of inorg.-organic proton conductors from trimethoxysilanes and tetraethoxysilane by sol-gel processing and their patterning by photoinduced methods)

IT Etching
(thermal, laser-induced; preparation of inorg.-organic proton conductors from trimethoxysilanes and tetraethoxysilane by sol-gel processing and their patterning by photoinduced methods)

IT 210160-22-8P
(preparation of inorg.-organic proton conductors from trimethoxysilanes and tetraethoxysilane by sol-gel processing and their patterning by photoinduced methods)

REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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                 OR 113923-91-4/BI OR 121-44-8/BI OR 141098-23-9/BI OR
                 142-84-7/BI OR 29295-80-5/BI OR 352211-30-4/BI OR 438245-54
                 -6/BI OR 742079-37-4/BI OR 742079-38-5/BI OR 742079-40-9/BI
                  OR 78-81-9/BI)
L3               STR
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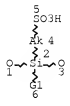


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NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   6

STEREO ATTRIBUTES: NONE
L5             9 SEA FILE=REGISTRY ABB=ON  PLU=ON  L2 AND S/ELS
L6           200 SEA FILE=HCAPLUS ABB=ON  PLU=ON  L5
L9               STR
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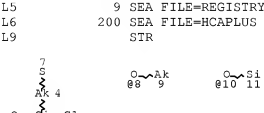


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VAR G1=O/AK/8/10
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS   9

STEREO ATTRIBUTES: NONE
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L14          125 SEA FILE=REGISTRY SUB=L11 SSS FUL L3
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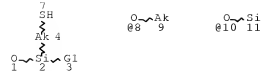


VAR G1=O/AK/8/10
NODE ATTRIBUTES:
DEFAULT MLEVEL IS ATOM
DEFAULT ECLEVEL IS LIMITED

GRAPH ATTRIBUTES:
RING(S) ARE ISOLATED OR EMBEDDED
NUMBER OF NODES IS 9

STEREO ATTRIBUTES: NONE

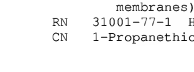
L17 1956 SEA FILE=REGISTRY SUB=L11 SSS FUL L15
L18 133 SEA FILE=HCAPLUS ABB=ON PLU=ON L14
L19 6250 SEA FILE=HCAPLUS ABB=ON PLU=ON L17
L20 33 SEA FILE=HCAPLUS ABB=ON PLU=ON L18 AND PROTON(2A)CONDUCT?

L21 1517 SEA FILE=HCAPLUS ABB=ON PLU=ON L19(L)PREP/RL
L28 30 SEA FILE=HCAPLUS ABB=ON PLU=ON L18 AND ((EXCHANG? OR CONDUCT?)(2A)MEMBRAN? OR PEM OR MEA OR MEMBRANE ELECTRODE ASSEMBLY?)
L29 46 SEA FILE=HCAPLUS ABB=ON PLU=ON L21 AND ((EXCHANG? OR CONDUCT?)(2A)MEMBRAN? OR PEM OR MEA OR MEMBRANE ELECTRODE ASSEMBLY?)
L30 17 SEA FILE=HCAPLUS ABB=ON PLU=ON L6 AND ((EXCHANG? OR CONDUCT?)(2A)MEMBRAN? OR PEM OR MEA OR MEMBRANE ELECTRODE ASSEMBLY?)
L31 39 SEA FILE=HCAPLUS ABB=ON PLU=ON L20 OR L28
L32 14 SEA FILE=HCAPLUS ABB=ON PLU=ON L31 AND (L30 OR L29)
L33 25 SEA FILE=HCAPLUS ABB=ON PLU=ON L31 NOT L32
L34 34 SEA FILE=HCAPLUS ABB=ON PLU=ON (L29 OR L30) NOT ((L31 OR L32 OR L33))

=> d l34 1-34 ibib ed abs hitstr hitind

L34 ANSWER 1 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2008:1371809 HCAPLUS Full-text
DOCUMENT NUMBER: 150:38014
TITLE: Functionalized Organic-Inorganic Nanostructured N-p-Carboxy Benzyl Chitosan-Silica-PVA Hybrid Polyelectrolyte Complex as Proton Exchange Membrane for DMFC Applications
AUTHOR(S): Tripathi, Bijay P.; Shahi, Vinod K.
CORPORATE SOURCE: Electro-Membrane Processes Division, Central Salt and Marine Chemicals Research Institute, Council of Scientific and Industrial Research (CSIR), Bhavnagar (Gujarat), 364002, India
SOURCE: Journal of Physical Chemistry B (2008), 112(49), 15678-15690
CODEN: JPCBFK; ISSN: 1520-6106
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal

LANGUAGE: English
ED Entered STN: 16 Nov 2008
AB Chitosan was modified into N-p-carboxybenzyl chitosan (NCBC) by introducing an aromatic ring grafted with carboxylic acid as the proton conducting group. A preparation procedure of highly conductive and stable organic-inorg. nanostructured NCBC-silica-poly(vinyl alc.) (PVA), proton exchange membrane (PEM) for direct methanol fuel cell (DMFC), by the sol-gel method in aqueous media has been reported. These PEMs were developed by crosslinking and designed to consist of weak proton conducting (-COOH) groups at organic segments and strong proton conducting (-SO3H) groups at inorg. segments to achieve high charge d. and stabilities. Crosslinking d. and NCBC-silica content in the membrane matrix were systematically optimized to control their nanostructure, thermal, mech., and chemical stabilities, as well as proton and fuel transport properties. Developed PEMs were extensively characterized by studying their physicochem. and electrochem. properties under DMFC operating conditions. As these PEMs were well processed as self-supporting film, they showed high stabilities and proton conductivity and low methanol permeability. Moreover, among all synthesized membranes, PCS-3-3 hybrid PEM exhibited quite a high selectivity parameter in comparison to Nafion 117 membrane for DMFC applications.
IT 31001-77-1DP, reaction products, oxidized
(organic-inorg. hybrid materials, fuel cell membranes; functionalized nanostructured organic-inorg. (carboxybenzyl)chitosan-based fuel cell membranes)
RN 31001-77-1 HCAPLUS
CN 1-Propanethiol, 3-(dimethoxymethylsilyl)- (CA INDEX NAME)



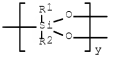
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST org inorg carboxybenzyl chitosan proton exchange membrane; polyvinyl alc mercaptopropyl silane org inorg proton exchange membrane
IT Fuel cell separators
(proton-exchange membranes; functionalized nanostructured organic-inorg. (carboxybenzyl)chitosan-based fuel cell membranes)
IT 78-10-4DP, Tetraethoxysilane, reaction products 619-66-9DP, 4-Carboxybenzaldehyde, reaction products with chitosan 7631-86-9DP, Silica, reaction products 9002-89-5DP, Poly(vinyl alcohol), reaction products 9012-76-4DP, Chitosan, N-p-carboxybenzyl derivs., reaction products 31001-77-1DP, reaction products, oxidized
(organic-inorg. hybrid materials, fuel cell membranes; functionalized nanostructured organic-inorg. (carboxybenzyl)chitosan-based fuel cell membranes)
REFERENCE COUNT: 66 THERE ARE 66 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 2 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2008:1338461 HCAPLUS Full-text
DOCUMENT NUMBER: 149:538023
TITLE: Membrane electrode

assembly (MEA) with improved bonding performance between catalytic electrode layer and solid electrolyte membrane for fuel cell and fuel cell using the same
INVENTOR(S): Fujinami, Tatsuo; Takami, Masanobu
PATENT ASSIGNEE(S): Shizuoka University, Japan; Toyota Motor Corp.
SOURCE: Jpn. Kokai Tokkyo Koho, 11pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2008269835	A	20081106	JP 2007-108202	20070417
PRIORITY APPLN. INFO.:			JP 2007-108202	20070417

ED Entered STN: 07 Nov 2008
GI



I

AB The MEA contains catalytic electrode layers involving an electrolyte material for a catalytic electrode layer and comopsed of a proton-conductive organosilicon polymer and catalytst-loaded elec. conductive material and a solid electrolyte membrane which is sandwiched between the catalytic electrode layers and contains electrolyte materials involving a Si-based compound, preferably, SiO2, for solid electrolyte membranes. Preferably, the organosilicon polymer involves linking groups of (R1R2SiO)x and/or I (R1-R3 = aliphatic or aromatic group; x, y = number of bonded units).

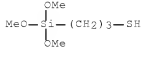
IT 1072928-13-2P
(MEA with improved interlayer adhesion for fuel cell)

RN 1072928-13-2 HCAPLUS

CN 1-Propanethiol, 3-(trimethoxysilyl)-, polymer with trimethoxypentylsilane and trimethoxy-2-propen-1-ylsilane (CA INDEX NAME)

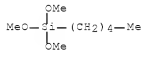
CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



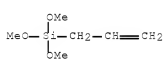
CM 2

CRN 2996-95-4
CMF C8 H20 O3 Si



CM 3

CRN 2551-83-9
CMF C6 H14 O3 Si



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST membrane electrode assembly interlayer adhesion; polysiloxane electrolyte membrane electrode assembly; silsesquioxane electrolyte membrane electrode assembly
IT Fuel cell electrolytes
Fuel cells
(MEA with improved interlayer adhesion for fuel cell)
IT Polysiloxanes, uses
Silsesquioxanes
(MEA with improved interlayer adhesion for fuel cell)
IT Polyoxyalkylenes, uses
(fluorine- and sulfo-containing, ionomers, containing SiO2, solid electrolyte emembrane; MEA with improved interlayer adhesion for fuel cell)
IT Fluoropolymers, uses
(polyoxyalkylene-, sulfo-containing, ionomers, containing SiO2, solid electrolyte emembrane; MEA with improved interlayer adhesion for fuel cell)
IT Ionomers
(polyoxyalkylenes, fluorine- and sulfo-containing, containing SiO2, solid electrolyte emembrane; MEA with improved interlayer adhesion for fuel cell)
IT 1472928-13-2P
(MEA with improved interlayer adhesion for fuel cell)
IT 7631-86-9, Silica, uses

(solid electrolyte membrane containing; MEA with improved interlayer adhesion for fuel cell)

L34 ANSWER 3 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2008:1155134 HCAPLUS Full-text
DOCUMENT NUMBER: 149:382310
TITLE: Electrode binder, electrode, membrane-electrode assembly, and solid polymer fuel cell
INVENTOR(S): Konno, Yoshiharu; Miyama, Toshihito; Nakajima, Hideyasu; Kanoh, Masashi
PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan
SOURCE: PCT Int. Appl., 55pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2008114688	A1	20080925	WO 2008-JP54622	20080313

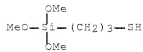
W: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

PRIORITY APPLN. INFO.:	JP 2007-69493	A	20070316
	JP 2007-193697	A	20070725
	JP 2007-255896	A	20070928

ED Entered STN: 25 Sep 2008
AB The electrode binder, used for constituting catalyst layers of electrodes, contains a crosslinkable compound (X) having a Si-O bond, a polymer material (Y) containing an acid group, and an aqueous dispersion (Z) containing a thermoplastic resin. The electrode has a catalyst layer formed by a catalyst ink containing the above electrode binder and a catalyst loaded conductive material. The membrane- electrode assembly has the electrode on both sides of an electrolyte membrane. The fuel cell has the above membrane-electrode assembly.
IT 161000-64-2, 3-Mercaptopropyl trimethoxy silane-tetraethoxy silane copolymer
(components of electrode binders for electrode catalyst layers in membrane-electrode assemblies for fuel cells)
RN 161000-64-2 HCAPLUS
CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

CRN 78-10-4
CMF C8 H20 O4 Si

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT 67-63-0, Isopropyl alcohol, uses 121-44-8, Triethyl amine, uses 681-84-5, Tetramethoxy silane 9002-84-0, PTFE 9002-88-4, Polyethylene 9036-19-5, Poly(oxyethylene)octyl phenyl ether 9063-89-2, Poly(oxyethylene)octyl phenyl ether 25067-11-2, Neoflon ND-1 27119-07-9 50851-57-5 66796-30-3, Nafion 117 161000-64-2, 3-Mercaptopropyl trimethoxy silane-tetraethoxy silane copolymer 354114-33-3, TGP-H-060
(components of electrode binders for electrode catalyst layers in membrane-electrode assemblies for fuel cells)
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 4 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2008:734388 HCAPLUS Full-text
DOCUMENT NUMBER: 149:57699
TITLE: Proton-conductive membrane containing crosslinked electrolyte, membrane-electrode assembly, and polymer electrolyte fuel cell
INVENTOR(S): Nakajima, Hideyasu; Konno, Yoshiharu
PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 28pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE

JP 2008140665	A	20080619	JP 2006-326140	20061201
PRIORITY APPLN. INFO.:			JP 2006-326140	20061201

ED Entered STN: 19 Jun 2008

AB The proton-conductive membrane contains a crosslinked electrolyte having acid groups and crosslinks via Si-O bonds, wherein unreacted OH terminals of the crosslinked electrolyte is treated with silylation agents. The membrane-electrode assembly (MEA) has gas-diffusion electrodes on both sides of the proton-conductive membrane. A polymer electrolyte fuel cell containing the MEA is also claimed. The membrane shows high proton conductivity and high resistance to impact and polar solvents.

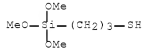
IT 161000-64-2DP, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, oxidized, reaction products with nonafluorohexylmethyldichlorosilane
(sulfo-containing, electrolyte containing; impact- and solvent-resistant, proton-conductive membrane containing acid group-containing crosslinked siloxane electrolyte for membrane -electrode assembly and polymer electrolyte fuel cell)

RN 161000-64-2 HCAPLUS

CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

CRN 78-10-4
CMF C8 H20 O4 Si

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST proton conductive membrane crosslinked siloxane electrolyte; polymer electrolyte fuel cell crosslinked siloxane

IT Silsesquioxanes
(fluorine-containing, silicate-, sulfo-containing; impact- and

solvent-resistant, proton-conductive membrane containing acid group-containing crosslinked siloxane electrolyte for membrane-electrode assembly and polymer electrolyte fuel cell)

IT Fuel cell electrolytes
Impact-resistant materials
(impact- and solvent-resistant, proton-conductive membrane containing acid group-containing crosslinked siloxane electrolyte for membrane-electrode assembly and polymer electrolyte fuel cell)

IT Silylation
(of silanol groups; impact- and solvent-resistant, proton-conductive membrane containing acid group-containing crosslinked siloxane electrolyte for membrane-electrode assembly and polymer electrolyte fuel cell)

IT Fuel cells
(polymer electrolyte; impact- and solvent-resistant, proton-conductive membrane containing acid group-containing crosslinked siloxane electrolyte for membrane-electrode assembly and polymer electrolyte fuel cell)

IT Ionic conductors
(polymeric; impact- and solvent-resistant, proton-conductive membrane containing acid group-containing crosslinked siloxane electrolyte for membrane-electrode assembly and polymer electrolyte fuel cell)

IT Silsesquioxanes
(silicate-, fluorine- and sulfo-containing; impact- and solvent-resistant, proton-conductive membrane containing acid group-containing crosslinked siloxane electrolyte for membrane-electrode assembly and polymer electrolyte fuel cell)

IT Fluoropolymers, uses
(silsesquioxane-, silicate-, sulfo-containing; impact- and solvent-resistant, proton-conductive membrane containing acid group-containing crosslinked siloxane electrolyte for membrane-electrode assembly and polymer electrolyte fuel cell)

IT 38436-16-7DP, reaction products with sulfo-containing crosslinked siloxane
(electrolyte containing; impact- and solvent-resistant, proton-conductive membrane containing acid group-containing crosslinked siloxane electrolyte for membrane-electrode assembly and polymer electrolyte fuel cell)

IT 9002-88-4, Polyethylene
(porous film, impregnated with siloxane, electrolyte; impact- and solvent-resistant, proton-conductive membrane containing acid group-containing crosslinked siloxane electrolyte for membrane-electrode assembly and polymer electrolyte fuel cell)

IT 161000-64-2DP, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, oxidized, reaction products with nonafluorohexylmethyldichlorosilane
(sulfo-containing, electrolyte containing; impact- and solvent-resistant, proton-conductive membrane containing acid group-containing crosslinked siloxane electrolyte for membrane-electrode assembly and polymer electrolyte fuel cell)

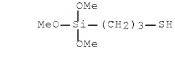
L34 ANSWER 5 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2008:418118 HCAPLUS Full-text
DOCUMENT NUMBER: 148:406468
TITLE: Membrane-electrode assemblies with good interlayer adhesion, their manufacture, and polymer electrolyte fuel cells using them
INVENTOR(S): Konno, Yoshiharu; Koma, Satoshi; Kano, Masashi; Miyama, Toshihito
PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 23pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2008078051	A	20080403	JP 2006-258029	20060922
PRIORITY APPLN. INFO.:			JP 2006-258029	20060922

ED Entered STN: 03 Apr 2008
AB In the assemblies (MEA), three-dimensionally crosslinked oligomers, inorg. powders, and optional aqueous thermoplastic dispersions exist in adhesive layers between proton-conductive membranes and gas diffusion electrodes, or sides of the gas diffusion electrodes in contact with the proton-conductive membranes. The oligomers comprise first structural units having metal-O bond, and second structural units having metal-O bond and covalently bonded acid groups. The MEA are manufactured by coating liqs. containing crosslinkable oligomers and inorg. powders on gas diffusion electrodes and/or proton-conductive membranes, bonding the gas diffusion electrodes to the proton-conductive membranes via liquid-coated sides, and curing the liqs. Thus, an MEA was manufactured by using an adhesive containing SO3H-containing oligomer (manufactured by oxidization of 3-mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer) and Scotchlite S 60HS (silica balloon).
IT 161000-64-2P, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer
(X 41-1805, peracetic acid-doped, proton-conductive membrane; manufacture of membrane-electrode assemblies using adhesives containing three-dimensionally crosslinked oligomers and inorg. powders)
RN 161000-64-2 HCAPLUS
CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

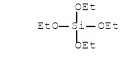
CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

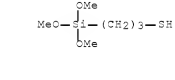
CRN 78-10-4
CMF C8 H20 O4 Si



IT 161000-64-2DP, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, oxidized
(manufacture of membrane-electrode assemblies using adhesives containing three-dimensionally crosslinked oligomers and inorg. powders)
RN 161000-64-2 HCAPLUS
CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

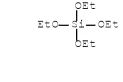
CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

CRN 78-10-4
CMF C8 H20 O4 Si



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST sulfo mercaptopropyltrimethoxysilane tetraethoxysilane copolymer adhesive membrane electrode assembly; polymer electrolyte fuel cell MEA interlayer adhesion
IT 161000-64-2P, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer

(X 41-1805, peracetic acid-doped, proton-conductive membrane; manufacture of membrane-electrode assemblies using adhesives containing three-dimensionally crosslinked oligomers and inorg. powders)

IT 79-21-0, Peracetic acid
(dopant in proton-conductive membrane; manufacture of membrane-electrode assemblies using adhesives containing three-dimensionally crosslinked oligomers and inorg. powders)

IT 161000-64-2DP, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, oxidized
(manufacture of membrane-electrode assemblies using adhesives containing three-dimensionally crosslinked oligomers and inorg. powders)

L34 ANSWER 6 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2008:411019 HCAPLUS Full-text
DOCUMENT NUMBER: 148:392195
TITLE: Silicon-oxygen-crosslinked structures, their manufacture, silicone rubber compositions containing them, and proton-conductive polymer electrolyte membranes from them
INVENTOR(S): Fukushima, Motoo; Yamatani, Masaaki; Yamamoto, Akira
PATENT ASSIGNEE(S): Shin-Etsu Chemical Industry Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 21pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2008074989	A	20080403	JP 2006-256741	20060922
PRIORITY APPLN. INFO.:			JP 2006-256741	20060922

ED Entered STN: 03 Apr 2008

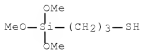
AB The compns. contain triorganosilyl- or diorganohydroxysilyl-terminated organopolysiloxanes bearing ≥2 vinyl groups RaSiO(4-a)/2 [A; R = C1-10 (un)substituted hydrocarbyl; a = 1.95-2.05] 100, the structures (B) manufactured by adding H2O and oxidizers to epoxy-containing alkoxysilanes and S-containing alkoxysilanes for cohydrolysis-condensation of them and conversion of S-containing groups to sulfonic acid groups by the oxidizers, ring-opening of epoxy groups, and condensation of OH groups generated 20-400, and crosslinking agents (C) 0.1-10 parts, thus giving good ion conductivity, strength, heat and moisture resistance, and sealability to the membranes, useful for fuel cells and sensors.

IT 860438-57-9DP, sulfonated, ammonium or methylimidazole salts
(manufacture of Si-O-crosslinked structures from alkoxysilanes for silicone rubber electrolyte membranes)

RN 860438-57-9 HCAPLUS
CN 1-Propanethiol, 3-(trimethoxysilyl)-, polymer with trimethoxy[3-(2-oxiranylmethoxy)propyl]silane (CA INDEX NAME)

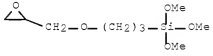
CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

CRN 2530-83-8
CMF C9 H20 O5 Si



CC 76-2 (Electric Phenomena)
Section cross-reference(s): 38, 39
IT 616-47-7DP, 1-Methylimidazole, salts with sulfonated epoxy-containing alkoxysilane condensates 14798-03-9DP, Ammonium, salts with sulfonated epoxy-containing alkoxysilane condensates 860438-57-9DP , sulfonated, ammonium or methylimidazole salts
(manufacture of Si-O-crosslinked structures from alkoxysilanes for silicone rubber electrolyte membranes)

L34 ANSWER 7 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2008:349333 HCAPLUS Full-text
DOCUMENT NUMBER: 148:359058
TITLE: Proton-conductive electrolyte membranes for fuel cells, and membrane-catalyst layer assemblies and membrane-electrode assemblies for the fuel cells
INVENTOR(S): Nishimura, Hironobu; Hiromitsu, Aya
PATENT ASSIGNEE(S): Dainippon Printing Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 8pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2008065988	A	20080321	JP 2006-239299	20060904
PRIORITY APPLN. INFO.:			JP 2006-239299	20060904

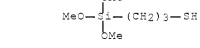
ED Entered STN: 21 Mar 2008
AB Title electrolyte membranes comprise porous substrates, and oxide thin films covering surface of the substrates and surface of inner pores of the substrates, wherein the oxide thin films are surface modified with mol. chains bearing proton-conductive functional groups. Title membrane-catalyst layer assemblies consist of the electrolyte membranes, and catalyst layers

containing catalyst particles and binders on both sides of the membranes. The membranes show high dimensional stability under moist environment and high gas-barrier performance.

IT 4420-74-0DP, (3-Mercaptopropyl)trimethoxysilane, reaction products with silica, oxidized
(thin film coatings, on porous substrates; proton-conductive electrolyte membranes made of porous substrates coated with surface-modified oxide films for fuel cells)

RN 4420-74-0 HCAPLUS

CN 1-Propanethiol, 3-(trimethoxysilyl)- (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

IT Fuel cell electrolytes
Fuel cells
(proton-conductive electrolyte membranes made of porous substrates coated with surface-modified oxide films for fuel cells)

IT Fluoropolymers, uses
(proton-conductive electrolyte membranes made of porous substrates coated with surface-modified oxide films for fuel cells)

IT 9002-84-0, Polytetrafluoroethylene
(H 010A090C, porous substrates; proton-conductive electrolyte membranes made of porous substrates coated with surface-modified oxide films for fuel cells)

IT 4420-74-0DP, (3-Mercaptopropyl)trimethoxysilane, reaction products with silica, oxidized 7631-86-9DP, Silica, reaction products with (3-mercaptopropyl)trimethoxysilane, oxidized
(thin film coatings, on porous substrates; proton-conductive electrolyte membranes made of porous substrates coated with surface-modified oxide films for fuel cells)

L34 ANSWER 8 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2008:349239 HCAPLUS Full-text

DOCUMENT NUMBER: 148:359057

TITLE: Proton-conducting membranes containing crosslinking electrolytes, membrane electrode assemblies (MEA), and polymer electrolyte fuel cells (PEFC)

INVENTOR(S): Nakajima, Hideyasu; Miyama, Toshihito

PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 26pp.
CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

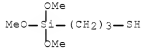
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2008065992	A	20080321	JP 2006-239356	20060904

PRIORITY APPLN. INFO.: JP 2006-239356 20060904

ED Entered STN: 21 Mar 2008
AB The title membranes comprise crosslinking electrolytes containing acid groups, Si-O crosslinkage, and (A) mols. containing hetero atoms forming ionic crosslinkage with proton-dissociated conjugated bases. Also claimed are MEA including the above given membranes and PEFC including the MEA. The membranes show high proton conductivity, high fuel barrier characteristics, and excellent resistance to polar solvents.
IT 161000-64-2DP, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, oxidized, reaction products with pyrazine 1011719-73-5DP, reaction products with hydroxypyridine, oxidized
(proton-conducting crosslinked siloxane membrane electrolytes in MEA for PEFC)
RN 161000-64-2 HCAPLUS
CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



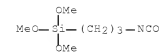
CM 2

CRN 78-10-4
CMF C8 H20 O4 Si

RN 1011719-73-5 HCAPLUS
CN Silicic acid (H4SiO4), tetraethyl ester, polymer with (3-isocyanatopropyl)trimethoxysilane and 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

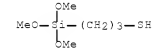
CM 1

CRN 15396-00-6
CMF C7 H15 N O4 Si



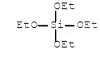
CM 2

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 3

CRN 78-10-4
CMF C8 H20 O4 Si



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST crosslinked siloxane polyelectrolyte MEA PEFC; polymer electrolyte fuel cell proton conductor membrane; membrane electrode assembly crosslinked polysiloxane
IT Fuel cell electrodes
(membrane electrode assemblies; proton-conducting crosslinked siloxane membrane electrolytes in MEA for PEFC)
IT Fuel cells
(polymer electrolyte; proton-conducting crosslinked siloxane membrane electrolytes in MEA for PEFC)
IT Silsesquioxanes
(polysiloxane-, sulfonated, crosslinked; proton-conducting crosslinked siloxane membrane electrolytes in MEA for PEFC)
IT Polyelectrolytes
(proton-conducting crosslinked siloxane membrane electrolytes in MEA for PEFC)
IT Polysiloxanes, uses
(silsesquioxane-, sulfonated, crosslinked; proton-

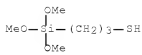
conducting crosslinked siloxane membrane electrolytes in MEA for PEFC)

IT 290-37-9DP, Pyrazine, reaction products with oxidized mercapto-containing siloxane 626-64-2DP, 4-Hydroxypyridine, reaction products with oxidized mercapto-containing siloxanes 161000-64-2DP, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, oxidized, reaction products with pyrazine 101719-73-5DP, reaction products with hydroxypyridine, oxidized (proton-conducting crosslinked siloxane membrane electrolytes in MEA for PEFC)

L34 ANSWER 9 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2008:165033 HCAPLUS Full-text
DOCUMENT NUMBER: 148:380639
TITLE: A novel route for the preparation of hybrid zwitterionic membranes containing both sulfonic and carboxylic acid groups
AUTHOR(S): Liu, Junsheng; Xu, Tongwen; Fu, Yanxun
CORPORATE SOURCE: Laboratory of Functional Membranes, School of Chemistry and Materials Science, University of Science and Technology of China (USTC), Hefei, 230026, Peop. Rep. China
SOURCE: Journal of Applied Polymer Science (2008), 107(5), 3033-3041
CODEN: JAPNAB; ISSN: 0021-8995
PUBLISHER: John Wiley & Sons, Inc.
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 08 Feb 2008
AB A novel route for the preparation of hybrid zwitterionic membranes containing both sulfonic and carboxylic acid groups is reported. Based on this synthetic methodol., a series of membranes were synthesized via sol-gel reaction, zwitterionization process, and the oxidization of the -SH group. FTIR spectra confirmed the corresponding reactions. The properties of these prepared membranes were characterized by ion-exchange capacity (IEC), water content, and pure water flux, etc. The anion-exchange capacity (AIEC), total cation-exchange capacity (CIECtotal), and the CIEC of the sulfonic groups (CIECsulf) of the membranes coated for 1-3 times were in the range of 0.017-0.12, 0.1-0.53, and 0.029-0.14 mmol g-1, resp. The measurement of water content showed that it was independent of pH values whether for the membranes coated once or twice. Pure water flux revealed a downward trend with the increased coating times. The surface SEM images of the produced membranes exhibited that these membranes' textures could be affected highly by the curing temperature, and excessively higher curing temperature would lead the membranes to brittle and chasm.
IT 797049-57-1DP, N-[3-(Trimethoxysilyl)propyl]ethylenediamine-(3-mercaptopropyl)trimethoxysilane copolymer, reaction product with γ-butyrolactone, mercapto-oxidized derivs. (preparation of hybrid zwitterionic membranes containing both sulfonic and carboxylic acid groups)
RN 797049-57-1 HCAPLUS
CN 1-Propanethiol, 3-(trimethoxysilyl)-, polymer with N1-[3-(trimethoxysilyl)propyl]-1,2-ethanediamine (CA INDEX NAME)

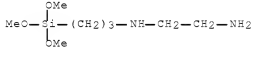
CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

CRN 1760-24-3
CMF C8 H22 N2 O3 Si



CC 38-3 (Plastics Fabrication and Uses)
IT Hybrid organic-inorganic materials
Ion exchange membranes
Sol-gel processing
Zwitterions
(preparation of hybrid zwitterionic membranes containing both sulfonic and carboxylic acid groups)
IT 96-48-0DP, γ-Butyrolactone, reaction product with N-(aminoethyl)aminopropyl- and 3-(mercaptopropyl)-containing silsesquioxanes, mercapto-oxidized derivs. 797049-57-1DP, N-[3-(Trimethoxysilyl)propyl]ethylenediamine-(3-mercaptopropyl)trimethoxysilane copolymer, reaction product with γ-butyrolactone, mercapto-oxidized derivs.
(preparation of hybrid zwitterionic membranes containing both sulfonic and carboxylic acid groups)
REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 10 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2007:1483833 HCAPLUS Full-text
DOCUMENT NUMBER: 148:147568
TITLE: Inorganic-organic hybrid amphoteric ion pair membrane material and its preparation method
INVENTOR(S): Liu, Junsheng; Cheng, Xinxing
PATENT ASSIGNEE(S): Hefei University, Peop. Rep. China
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 11pp. CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1010918?8	A	20071226	CN 2007-10021240	20070415

PRIORITY APPLN. INFO.: CN 2007-10021240 20070415

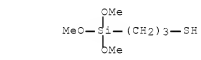
ED Entered STN: 31 Dec 2007

AB The title ion pair membrane material is prepared by at inert or air atmospheric, silane coupling agent reacting with diol or silane coupling agent, organic amine reacting with diol to form high polymer amine derivs., dissolving in solvent to obtain hybrid precursor-containing solution, aminating the hybrid precursor-containing solution at 0-90°C, then sulfonating or oxidizing to obtain the title product, or sulfonating or oxidizing hybrid precursor-containing solution, then aminating to obtain the title product. The title membrane material has good softness, high temperature resistance, and its anion, cation exchange capacity is related to preparation process. The title membrane material can be used for preparing ion exchange membrane material and used for separation of electrolyte and nonelectrolyte, and selective separation of polyvalent ions.

IT 4420-74-0DP, reaction products with chloroethane and γ-aminopropyl trimethoxy silane
(inorg.-organic hybrid amphoteric ion pair membrane material and its preparation method)

RN 4420-74-0 HCAPLUS

CN 1-Propanethiol, 3-(trimethoxysilyl)- (CA INDEX NAME)



CC 48-1 (Unit Operations and Processes)
Section cross-reference(s): 35

IT 74-88-4DP, Iodomethane, reaction products with γ-aminopropyl trimethoxy silane, mercaptopropyl trimethoxy silane and iodomethane 74-96-4DP, Bromoethane, reaction products with PEG-1000 and toluene Me triethoxy silane 74-96-4DP, Bromoethane, reaction products with N-β-aminoethyl-γ-aminopropyl trimethoxy silane and mercaptopropyl trimethoxy silane 75-00-3DP, Chloroethane, reaction products with γ-aminopropyl trimethoxy silane and mercaptopropyl trimethoxy silane 1760-24-3DP, N-β-Aminoethyl-γ-aminopropyl trimethoxy silane, reaction products with bromoethane and mercaptopropyl trimethoxy silane 4420-74-0DP, reaction products with chloroethane and γ-aminopropyl trimethoxy silane 4420-74-0DP, reaction products with γ-aminopropyl trimethoxy silane, n-Bu titanate and iodomethane 4420-74-0DP, reaction products with N-β-aminoethyl-γ-aminopropyl trimethoxy silane and bromoethane 5593-70-4DP, n-Butyl titanate, reaction products with iodomethane, γ-aminopropyl trimethoxy silane and mercaptopropyl trimethoxy silane 13822-56-5DP, γ-Aminopropyl trimethoxy silane, reaction products with chloroethane and mercaptopropyl trimethoxy silane 13822-56-5DP, γ-Aminopropyl trimethoxy silane, reaction products with n-Bu titanate, iodomethane and mercaptopropyl trimethoxy silane 25322-68-3DP, PEG-1000, reaction products with bromoethane and toluene Me triethoxy silane 1001205-63-5DP, reaction products with bromoethane and PEG-1000
(inorg.-organic hybrid amphoteric ion pair membrane material and its

preparation method)

L34 ANSWER 11 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2007:733193 HCAPLUS Full-text
DOCUMENT NUMBER: 147:147167
TITLE: Water insoluble additive for improving conductivity of an ion exchange membrane for high temperature fuel cell
INVENTOR(S): MacKinnon, Sean M.; McDermid, Scott J.; Bonorand, Lukas M.; Peckham, Timothy J.; Wang, Keping; Li, Jing
PATENT ASSIGNEE(S): USA
SOURCE: U.S. Pat. Appl. Publ., 10pp.
CODEN: USXXCO
DOCUMENT TYPE: Patent
LANGUAGE: English
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

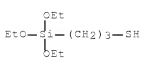
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20070154764	A1	20070705	US 2006-613803	20061220
WO 2008048317	A1	20080424	WO 2006-US48913	20061220
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LV, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW				
RW: AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG, BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
CN 101336265	A	20081231	CN 2006-80052357	20080805
PRIORITY APPLN. INFO.:			US 2005-753440P	P 20051222
			WO 2006-US48913	W 20061220

ED Entered STN: 06 Jul 2007
AB Disclosed is a water insol. additive for improving the performance of an ion-exchange membrane, such as in the context of the high temperature operation of electrochem. fuel cells. The insol. additive comprises a metal oxide cross-linked matrix having proton conducting groups covalently attached to the matrix through linkers. In one embodiment, the metal is silicon and the cross-linked matrix is a siloxane cross-linked matrix containing silicon atoms cross-linked by multiple disiloxy bonds and having proton conducting groups covalently attached to the silicon atoms through alkanediyl linkers.
IT 183212-27-3P
(water insol. additive for improving conductivity of ion exchange membrane for high temperature fuel cell)
RN 183212-27-3 HCAPLUS
CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(triethoxysilyl)-1-propanethiol (CA INDEX NAME)

CM 1

CRN 14814-09-6

CMF C9 H22 O3 S Si



CM 2

CRN 78-10-4
CMF C8 H20 O4 Si

INCL 429033000; 521027000
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST fuel cell ion exchange membrane cond
improvement additive
IT Carbon fibers, uses
(paper; water insol. additive for improving conductivity of ion exchange membrane for high temperature fuel cell)
IT Polyketones
(polyether-, aromatic; water insol. additive for improving conductivity of ion exchange membrane for high temperature fuel cell)
IT Polyethers, uses
(polyketone-, aromatic; water insol. additive for improving conductivity of ion exchange membrane for high temperature fuel cell)
IT Ionic liquids
(silica functionalized with; water insol. additive for improving conductivity of ion exchange membrane for high temperature fuel cell)
IT Sulfonic acids, uses
(silica functionalized with; water insol. additive for improving conductivity of ion exchange membrane for high temperature fuel cell)
IT Fuel cells
Ion exchange membranes
Membrane electrodes
(water insol. additive for improving conductivity of ion exchange membrane for high temperature fuel cell)
IT Oxides (inorganic), uses
Polyesters, uses
Polysiloxanes, uses
(water insol. additive for improving conductivity of ion exchange membrane for high temperature fuel cell)
IT 7440-06-4, Platinum, uses

(water insol. additive for improving conductivity of ion exchange membrane for high temperature fuel cell)

IT 25101-45-5D, sulfonated graft with diethylphosphonatopropyltriethoxysilane-tetraethoxysilane copolymer
(water insol. additive for improving conductivity of ion exchange membrane for high temperature fuel cell)

IT 13598-36-2DP, Phosphonic acid, titania-silica functionalized with 183212-27-3P 594860-27-2DP, chlorinated 594860-27-2P 943529-23-5DP, silica functionalized with
(water insol. additive for improving conductivity of ion exchange membrane for high temperature fuel cell)

IT 1314-23-4, Zirconium oxide, uses 1332-29-2, Tin oxide 1344-28-1, Aluminum oxide, uses 7631-86-9, Silicon oxide, uses 9002-88-4, Solupor 13463-67-7, Titanium oxide, uses 25038-59-9, Melinex 453, uses 157858-56-5, Germanium oxide
(water insol. additive for improving conductivity of ion exchange membrane for high temperature fuel cell)

L34 ANSWER 12 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2007:615246 HCAPLUS Full-text
DOCUMENT NUMBER: 147:12944
TITLE: Methanol-barrier proton-conductive membrane, its manufacture, and fuel cell having it
INVENTOR(S): Koma, Satoshi; Nakajima, Hideyasu; Miyama, Toshihito
PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 18pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007138028	A	20070607	JP 2005-334078	20051118
PRIORITY APPLN. INFO.:			JP 2005-334078	20051118

ED Entered STN: 07 Jun 2007

AB The proton-conductive membrane having sulfonic groups and metal-oxygen bonding crosslinking structures is manufactured by (A) preparing a liquid containing crosslinkable compds., which have metal-oxygen bonding structure units and metal-oxygen bonding structure units having covalently bonded mercapto and/or sulfide groups, (B) forming a membrane from the liquid, and (C) UV-irradiating or plasma-treating the membrane under steam atmospheric so as to cure the membrane and simultaneously convert the mercapto and/or sulfide groups into sulfonic groups. Direct methanol fuel cells (DMFC) with suppressed methanol crossover are provided with this invention.

IT 161000-64-2DP, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, sulfonated
(simultaneous sulfonation and curing by UV or plasma for methanol-barrier fuel cell electrolytes)

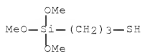
RN 161000-64-2 HCAPLUS

CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

CM 1

CRN 4420-74-0

CMF C6 H16 O3 S Si



CM 2

CRN 78-10-4
CMF C8 H20 O4 Si

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST proton conductive membrane DMFC simultaneous sulfonation curing UV; methanol crossover fuel cell proton conductor plasma sulfonation
IT 161000-64-2DP, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, sulfonated
(simultaneous sulfonation and curing by UV or plasma for methanol-barrier fuel cell electrolytes)

L34 ANSWER 13 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2007:460483 HCAPLUS Full-text
DOCUMENT NUMBER: 146:444920
TITLE: Fuel cells and their electrolyte membranes containing proton-conductive organic silicon compounds
INVENTOR(S): Kino, Katsuhiro; Koyanagi, Tsugio
PATENT ASSIGNEE(S): Catalysts and Chemicals Industries Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 16pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007109573	A	20070426	JP 2005-300698	20051014
PRIORITY APPLN. INFO.:			JP 2005-300698	20051014

ED Entered STN: 27 Apr 2007

AB The title membranes contain inorg. oxide microparticles having sulfonic acid groups on surface, hydrolyzed proton-conductive organic Si compds. RnSiX4-n (R = C1-10 hydrocarbyl; X = C1-4 alkoxy, silanol, halo, H; n = 0-3) forming matrixes, and proton donors. The membranes may satisfy proton conductivity ≥10-3 S/cm. Fuel cells employing the membranes show high proton conductivity and durability and suppress fuel crossover.

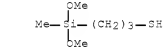
IT 934551-00-5DP, hydrolyzed 934551-01-6DP, hydrolyzed
(coupling agents, electrolyte membranes; fuel cell electrolyte membranes containing inorg. oxide particles having sulfonic acid groups on surface)

RN 934551-00-5 HCAPLUS

CN 1-Propanethiol, 3-(dimethoxymethylsilyl)-, polymer with 2-[[3-(diethoxymethylsilyl)propoxy]methyl]oxirane (CA INDEX NAME)

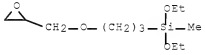
CM 1

CRN 31001-77-1
CMF C6 H16 O2 S Si



CM 2

CRN 2897-60-1
CMF C11 H24 O4 Si

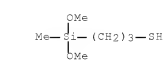


RN 934551-01-6 HCAPLUS

CN 1-Propanethiol, 3-(dimethoxymethylsilyl)-, polymer with 2-[[3-(trimethoxysilyl)propoxy]methyl]oxirane (CA INDEX NAME)

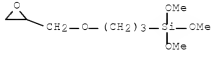
CM 1

CRN 31001-77-1
CMF C6 H16 O2 S Si



CM 2

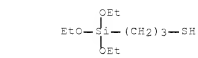
CRN 2530-83-8
CMF C9 H20 O5 Si



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
IT 934551-00-5DP, hydrolyzed 934551-01-6DP, hydrolyzed
(coupling agents, electrolyte membranes; fuel cell electrolyte membranes containing inorg. oxide particles having sulfonic acid groups on surface)

L34 ANSWER 14 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2007:399877 HCAPLUS Full-text
DOCUMENT NUMBER: 147:32129
TITLE: Hybridization of Nafion membranes by the infusion of functionalized siloxane precursors
AUTHOR(S): Lavorgna, Marino; Mascia, Leno; Mensitieri, Giuseppe; Gilbert, Marianne; Scherillo, Giuseppe; Palomba, Biagio
CORPORATE SOURCE: Institute of Composite and Biomedical Materials, National Research Council, Portici, NA, 80055, Italy
SOURCE: Journal of Membrane Science (2007), 294(1+2), 159-168
CODEN: JMESDO; ISSN: 0376-7388
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 11 Apr 2007
AB Polysiloxane-modified hybrid membranes were prepared by introducing in a pre-swelled com. Nafion membrane a sol-gel precursor solution, consisting of a pre-hydrolyzed mixture of tetraethoxysilane and a mercaptan functionalized organoalkoxysilane. The structure of the polysiloxane network was changed by altering the ratio of the two silane components within the precursor solution The mercaptosilane modifier was used to provide an addnl. source of acidic Bronsted sites through the oxidization of the mercaptan groups to sulfonic acid groups. The phys. and chemical properties of the hybrid membranes were examined by TGA, FT-IR and SEM-EDS anal. The water vapor sorption and proton conductivity characteristics were evaluated at 40, 60 and 70° and with water activity in the region of 0.4-1. The polysiloxane network alters the water vapor sorption mechanism of the Nafion membrane, resulting in an increase in the equilibrium amount of water absorbed in the middle range of water activity (0.4-0.6). At the same time, the increased water sorption capability produced a concomitant increase in ionic conductivity at low water activities.
IT 14814-09-6DP, (3-Mercaptopropyl)triethoxysilane, reaction product with Nafion 117
(preparation and hybridization of Nafion membranes by infusion of functionalized siloxane precursors)

RN 14814-09-6 HCAPLUS
CN 1-Propanethiol, 3-(triethoxysilyl)- (CA INDEX NAME)



CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 52
IT Fuel cells
(proton exchange membrane; preparation and hybridization of Nafion membranes by infusion of functionalized siloxane precursors)
IT 78-10-4DP, Tetraethoxysilane, reaction product with Nafion 117 14814-09-6DP, (3-Mercaptopropyl)triethoxysilane, reaction product with Nafion 117 66796-30-3DP, Nafion 117, reaction product with alkoxysilanes
(preparation and hybridization of Nafion membranes by infusion of functionalized siloxane precursors)
REFERENCE COUNT: 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 15 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2007:328310 HCAPLUS Full-text
DOCUMENT NUMBER: 146:320241
TITLE: Manufacture of membrane-electrode assemblies with good heat and chemical resistance, and solid polymer electrolyte fuel cells using them
INVENTOR(S): Koma, Satoshi; Konno, Yoshiharu; Nomura, Shigeki
PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 23pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2007073310	A	20070322	JP 2005-258177	20050906
PRIORITY APPLN. INFO.:			JP 2005-258177	20050906

ED Entered STN: 22 Mar 2007
AB The assemblies are manufactured by applying liqs. containing crosslinkable oligomers comprising (A) structural units with metal-oxygen bonds and (B) structural units with acid groups and covalently bonded to A on proton-conductive membranes or gas diffusion electrodes, laminating the polymer-coated proton-conductive membranes or the polymer-coated gas diffusion electrodes with gas diffusion electrodes or proton-conductive membranes, resp., and curing the liqs. Alternatively, catalysts are supported on the gas diffusion electrodes. The assemblies include three-dimensionally crosslinked oligomers are also claimed. Thus, a proton-conductive membrane was coated with an iso-PrOH solution containing oxidized 3-mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, laminated with a

Pt-containing gas diffusion electrode, and hot-pressed to give a membrane-electrode assembly showing good interlayer adhesion after heating or soaking in MeOH.

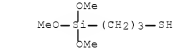
IT 161000-64-2DP, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, oxidized
(manufacture of membrane-electrode assemblies with good heat and chemical resistance for polymer electrolyte fuel cells)

RN 161000-64-2 HCAPLUS

CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

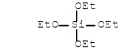
CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

CRN 78-10-4
CMF C8 H20 O4 Si



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST sulfo silsesquioxane silicate membrane electrode assembly; membrane electrode assembly heat resistance; chem resistance polymer electrolyte fuel cell

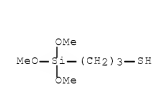
IT 161000-64-2DP, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, oxidized
(manufacture of membrane-electrode assemblies with good heat and chemical resistance for polymer electrolyte fuel cells)

L34 ANSWER 16 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2006:1273413 HCAPLUS Full-text
DOCUMENT NUMBER: 146:82784
TITLE: Polymer nanomaterial compound membrane containing proton conductive titanate for fuel cell
INVENTOR(S): Kim, Hye Gyeong; Lee, Jae Seong; Kim, Yeong Kwon; Chang, Hyeok

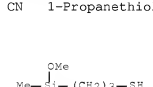
PATENT ASSIGNEE(S): Samsung SDI Co., Ltd., S. Korea
SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 43pp.
CODEN: CNXXEV
DOCUMENT TYPE: Patent
LANGUAGE: Chinese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1869011	A	20061129	CN 2006-10080105	20060428
KR 2006122198	A	20061130	KR 2005-44253	20050525
US 20070053826	A1	20070308	US 2006-438229	20060523
JP 2006332063	A	20061207	JP 2006-145956	20060525
PRIORITY APPLN. INFO.:			KR 2005-44253 A	20050525

ED Entered STN: 06 Dec 2006
AB The title proton conductive titanate contains a proton conductive part having sulfonic acid group on the surface of titanate via ether bonding. This invention also provides proton conductive titanate containing polymer nanomaterial compound membrane and fuel cell containing this polymer nanomaterial compound membrane. The proton conductive titanate of polymer nanomaterial compound membrane has the advantages of controllable swelling degree in methanol and reduced transmittance of polymer nanomaterial compound membrane. This polymer nanomaterial compound membrane can be used as proton conductive membrane of fuel cell to improve thermal stability, energy d., and fuel efficiency of a fuel cell.
IT 4420-74-0DP, 3-Mercaptopropyltrimethoxysilane, reaction products with ammonium titanate 31001-77-1DP, 3-Mercaptopropyldimethoxymethylsilane, reaction products with ammonium titanate
(polymer nanomaterial compound membrane containing proton conductive titanate-sulfonic acid for fuel cell)
RN 4420-74-0 HCAPLUS
CN 1-Propanethiol, 3-(trimethoxysilyl)- (CA INDEX NAME)



RN 31001-77-1 HCAPLUS
CN 1-Propanethiol, 3-(dimethoxymethylsilyl)- (CA INDEX NAME)



CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 52

ST titanate sultone proton conductive polymer nanomaterial membrane fuel cell

IT Polyoxyalkylenes, uses
(fluorine- and sulfo-containing, ionomers; polymer nanomaterial compound membrane containing proton conductive titanate-sulfonic acid for fuel cell)

IT Polyketones
(polyether-, sulfonated; polymer nanomaterial compound membrane containing proton conductive titanate-sulfonic acid for fuel cell)

IT Polyethers, uses
(polyketone-, sulfonated; polymer nanomaterial compound membrane containing proton conductive titanate-sulfonic acid for fuel cell)

IT Fuel cells
Membranes, nonbiological
Nanostructured materials
(polymer nanomaterial compound membrane containing proton conductive titanate-sulfonic acid for fuel cell)

IT Fluoropolymers, uses
(polyoxyalkylene-, sulfo-containing, ionomers; polymer nanomaterial compound membrane containing proton conductive titanate-sulfonic acid for fuel cell)

IT Ionomers
(polyoxyalkylenes, fluorine- and sulfo-containing; polymer nanomaterial compound membrane containing proton conductive titanate-sulfonic acid for fuel cell)

IT Fluoropolymers, uses
Polyimides, uses
Polysulfones, uses
(sulfonated; polymer nanomaterial compound membrane containing proton conductive titanate-sulfonic acid for fuel cell)

IT 36583-77-4P, Ammonium titanate 99601-82-8P, Hydrogen Titanate h2ti3o7
(polymer nanomaterial compound membrane containing proton conductive titanate-sulfonic acid for fuel cell)

IT 1120-71-4DP, 1,3-Propanesultone, reaction products with ammonium titanate 1633-83-6DP, 1,4-Butanesultone, reaction products with ammonium titanate 4420-74-0DP, 3-Mercaptopropyltrimethoxysilane, reaction products with ammonium titanate 31001-77-1DP, 3-Mercaptopropyldimethoxymethylsilane, reaction products with ammonium titanate 36583-77-4DP, Ammonium titanate, reaction products with sultones
(polymer nanomaterial compound membrane containing proton conductive titanate-sulfonic acid for fuel cell)

IT 9003-53-6D, Polystyrene, sulfonated
(polymer nanomaterial compound membrane containing proton conductive titanate-sulfonic acid for fuel cell)

IT 1336-21-6, Ammonium hydroxide 13825-74-6, Titanium oxysulfate
(polymer nanomaterial compound membrane containing proton conductive titanate-sulfonic acid for fuel cell)

L34 ANSWER 17 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2006:1242806 HCAPLUS Full-text
DOCUMENT NUMBER: 145:507547
TITLE: Hybridized amphoteric ion exchange membrane containing different acidic groups and preparation method therefor
INVENTOR(S): Xu, Tongwen; Liu, Junsheng; Fu, Yanxun; Yang,

	Weihua
PATENT ASSIGNEE(S):	University of Science and Technology of China, Peop. Rep. China
SOURCE:	Faming Zhuanli Shenqing Gongkai Shuomingshu, 13pp. CODEN: CNXXEV
DOCUMENT TYPE:	Patent
LANGUAGE:	Chinese
FAMILY ACC. NUM. COUNT:	1
PATENT INFORMATION:	

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
CN 1864832	A	20061122	CN 2005-10040149	20050521
PRIORITY APPLN. INFO.:			CN 2005-10040149	20050521

ED Entered STN: 29 Nov 2006

AB The preparation method for an amphoteric ion exchange membrane comprises the steps of: using silane coupling agent or silane coupling agent and organic amine and diol reactant as the starting material, dissolving in inert gas or air atmospheric at a silane coupling agent to solvent ratio of 1:2-20, preparing a membrane with this sol-gel; oxidizing or sulfonating to give the membrane acidic groups; quaternizing to give the membrane amphoteric ion pair. The silane coupling agent has a general formula of [XR1YR2]pSiX4-p or [XYR1]pSiY*4-p, wherein X, Y is primary amine, secondary amine, aryl, mercapto, epoxy group, R1, R2 are alkyl or aryl containing 0-10 and 1-10 carbon atom nos. resp., Y* is C1-5 alkoxy or halogen (Br or Cl), p= 1-3. The organic amine is ethylene diamine, biphenylamine, p-phenylene diamine, diamino di-Ph ether, N,N-dihydroxyethyl methylamine, trimethylamine, triethylamine, tripropylamine or tributylamine. The diol comprises ethylene glycol, butanediol, hexylene glycol, polyethylene glycol or polyvinyl alc. The polymeric amine derivs. comprise polyurethane, polyether, polyamide, polyimide, polysiloxane-polyurea copolymer or Polysilicic urethane.

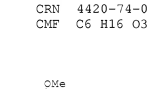
IT 797049-57-1DP, reaction products with butyrolactone, oxidized by hydrogen peroxide 915105-34-9DP, reaction products with butyrolactone, oxidized by hydrogen peroxide
(preparation of amphoteric ion membrane containing different acidic groups)

RN 797049-57-1 HCAPLUS

CN 1-Propanethiol, 3-(trimethoxysilyl)-, polymer with N1-[3-(trimethoxysilyl)propyl]-1,2-ethanediamine (CA INDEX NAME)

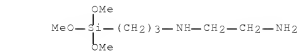
CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

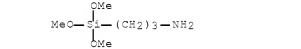
CRN 1760-24-3
CMF C8 H22 N2 O3 Si



RN 915105-34-9 HCAPLUS
CN 1-Butanol, titanium(4+) salt, polymer with
3-(trimethoxysilyl)-1-propanamine and
3-(trimethoxysilyl)-1-propanethiol (9CI) (CA INDEX NAME)

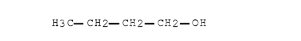
CM 1

CRN 13822-56-5
CMF C6 H17 N O3 Si



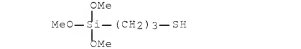
CM 2

CRN 5593-70-4
CMF C4 H10 O . 1/4 Ti



CM 3

CRN 4420-74-0
CMF C6 H16 O3 S Si



CC 47-2 (Apparatus and Plant Equipment)

Section cross-reference(s): 9, 35
IT Anion exchange membranes
Cation exchange membranes
Ion exchange membranes
(preparation of amphoteric ion membrane containing different acidic groups)
IT 96-48-0DP, Butyrolactone, reaction products with silsesquioxane 797049-57-1DP, reaction products with butyrolactone, oxidized by hydrogen peroxide 915105-31-6DP, sulfonated, reaction products with butyrolactone 915105-34-9DP, reaction products with butyrolactone, oxidized by hydrogen peroxide
(preparation of amphoteric ion membrane containing different acidic groups)

L34 ANSWER 18 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2006:874809 HCAPLUS Full-text
DOCUMENT NUMBER: 145:457578
TITLE: Organic silica/Nafion composite membrane for direct methanol fuel cells
AUTHOR(S): Ren, Suzhen; Sun, Gongquan; Li, Chennan; Liang, Zhenxing; Wu, Zhimou; Jin, Wei; Qin, Xin; Yang, Xuefeng
CORPORATE SOURCE: Direct Alcohol Fuel Cells Laboratory, Dalian Institute of Chemical Physics, Chinese Academy of Sciences, Dalian, 116023, Peop. Rep. China
SOURCE: Journal of Membrane Science (2006), 282(1+2), 450-455
CODEN: JMESDO; ISSN: 0376-7388
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 29 Aug 2006
AB The organic silica with thiol group/Nafion composite membranes were prepared by casting method using various additives including HS(CH2)3MeSi(OMe)2 (SH-), tetra-Et orthosilicate (TEOS) and HS(CH2)3MeSi(OMe)2-TEOS (HS-TEOS) in Nafion solns. All composite membranes had an adulterated content of 5%. SEM expts. indicated evenly distributed particles within all the Nafion composite membranes. The properties of the composite membranes in terms of methanol permeability, proton conductivity, and cell performance were evaluated by single cell of direct methanol fuel cell (DMFC). The 125 μm SH-TEOS/Nafion composite membranes showed .apprx.50% decrease of methanol crossover compared with the com. Nafion 117 membrane. The proton conductivity of the membrane lowered slightly compared with that of Nafion 117. The SH-TEOS/Nafion membrane was more suitable for DMFC of high concentration methanol than pure Nafion membrane.
IT 557088-80-9DP, sulfonic acid group-containing oxidized derivs.
(composites with Nafion; organic silica/Nafion composite membrane for direct methanol fuel cells)
RN 557088-80-9 HCAPLUS
CN 1-Propanethiol, 3-(dimethoxymethylsilyl)-, homopolymer (CA INDEX NAME)

CM 1

CRN 31001-77-1
CMF C6 H16 O2 S Si

IT 141098-23-9DP, sulfonic acid group-containing oxidized derivs.
(plain and composites with Nafion; organic silica/Nafion composite membrane for direct methanol fuel cells)
RN 141098-23-9 HCAPLUS
CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(dimethoxymethylsilyl)-1-propanethiol (9CI) (CA INDEX NAME)

CM 1

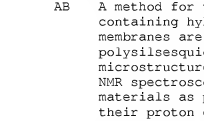
CRN 31001-77-1
CMF C6 H16 O2 S Si

CM 2

CRN 78-10-4
CMF C8 H20 O4 Si

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 36, 38, 76
IT Ionic conductivity
(proton, of membranes; organic silica/Nafion composite membrane for direct methanol fuel cells)
IT 11099-06-2P 557068-80-9DP, sulfonic acid group-containing oxidized derivs.
(composites with Nafion; organic silica/Nafion composite membrane for direct methanol fuel cells)
IT 141098-23-9DP, sulfonic acid group-containing oxidized derivs.
(plain and composites with Nafion; organic silica/Nafion composite membrane for direct methanol fuel cells)
REFERENCE COUNT: 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 19 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2006:675778 HCAPLUS Full-text
DOCUMENT NUMBER: 145:317867
TITLE: Hybrid Polyelectrolyte Materials for Fuel Cell Applications: Design, Synthesis, and Evaluation of Proton-Conducting Bridged Polysilsesquioxanes
AUTHOR(S): Khiterer, Mariya; Loy, Douglas A.; Cornelius, Christopher J.; Fujimoto, Cy H.; Small, James H.; McIntire, Theresa M.; Shea, Kenneth J.
CORPORATE SOURCE: Department of Chemistry, University of California, Irvine, CA, 92697, USA
SOURCE: Chemistry of Materials (2006), 18(16), 3665-3673
CODEN: CMATEX; ISSN: 0897-4756
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 13 Jul 2006
AB A method for the synthesis of chemical and thermally robust sulfonic-acid-containing hybrid membrane materials was established. These polyelectrolyte membranes are prepared by oxidation of the corresponding disulfide-bridged polysilsesquioxanes. This strategy allows for high acid-group loading. Their microstructure is determined by nitrogen adsorption porosimetry, solid-state NMR spectroscopy, and atomic force microscopy. Application of these hybrid materials as proton- exchange membranes for fuel cells is studied by measuring their proton conductivity, which increases linearly with increasing sulfonic acid content to 6.2 mS/cm.
IT 14814-09-6P, 3-Mercaptopropyltriethoxysilane
(design, synthesis, and evaluation of proton-conducting bridged polysilsesquioxanes as hybrid polyelectrolyte materials for fuel cell applications)
RN 14814-09-6 HCAPLUS
CN 1-Propanethiol, 3-(triethoxysilyl)- (CA INDEX NAME)

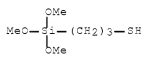


CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 76
ST polyelectrolyte fuel cell proton conducting membrane hybrid polysilsesquioxane xerogel
IT Fuel cells
(proton exchange membrane; design, synthesis, and evaluation of proton-conducting bridged polysilsesquioxanes as hybrid polyelectrolyte materials for fuel cell applications)
IT 14814-09-6P, 3-Mercaptopropyltriethoxysilane 52217-60-4P, 1,8-Bis(triethoxysilyl)octane
(design, synthesis, and evaluation of proton-conducting bridged polysilsesquioxanes as hybrid polyelectrolyte materials for fuel cell applications)
REFERENCE COUNT: 24 THERE ARE 24 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 20 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2006:516178 HCAPLUS Full-text
DOCUMENT NUMBER: 144:491983
TITLE: Porous ceramic proton conductors, their manufacture, proton exchange membranes, and fuel cells using them
INVENTOR(S): Kobayashi, Hiroshi; Tatsumisago, Masahiro; Tadanaga, Kiyoharu; Hayashi, Akitoshi; Nishiyama, Toshihiko
PATENT ASSIGNEE(S): Nec Tokin Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 12 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2006140098	A	20060601	JP 2004-330628	20041115
PRIORITY APPLN. INFO.:			JP 2004-330628	20041115

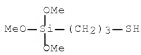
ED Entered STN: 02 Jun 2006
AB The proton conductors comprise main structures of ceramics having periodically arranged pores with uniform size and proton-conductive functional groups chemical bonded on the ceramics. Proton exchange membranes with suppressed MeOH permeation and yet high proton conductivity, useful for direct-methanol fuel cells (DMFC), are obtained with this invention.
IT 4420-74-0DP, (3-Mercaptopropyl)trimethoxysilane, reaction products with silica, sulfonated 113923-91-4DP, Mercaptopropyl trimethoxysilane-methyl orthosilicate copolymer, sulfonated
(porous ceramic proton conductors with suppressed MeOH permeability for DMFC)
RN 4420-74-0 HCAPLUS
CN 1-Propanethiol, 3-(trimethoxysilyl)- (CA INDEX NAME)



RN 113923-91-4 HCAPLUS
CN Silicic acid (H4SiO4), tetramethyl ester, polymer with 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

CRN 681-84-5
CMF C4 H12 O4 Si

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 57
ST ceramic proton conductor fuel cell methanol impermeability; porosity ceramic proton exchange membrane DMFC
IT 4420-74-0DP, (3-Mercaptopropyl)trimethoxysilane, reaction products with silica, sulfonated 7631-86-9DP, Silica, reaction products with mercaptopropyltrimethoxysilane, sulfonated 113923-91-4DP, Mercaptopropyl trimethoxysilane-methyl orthosilicate copolymer, sulfonated
(porous ceramic proton conductors with suppressed MeOH permeability for DMFC)

L34 ANSWER 21 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2006:493566 HCAPLUS Full-text
DOCUMENT NUMBER: 144:491901
TITLE: Electrolytes to be included in catalyst electrode layes of polymer-electrolyte fuel cells, and membrane-electrode assemblies
INVENTOR(S): Takami, Masanobu; Fujinami, Tatsuo
PATENT ASSIGNEE(S): Toyota Motor Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 10 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2006134765	A	20060525	JP 2004-324022	20041108
PRIORITY APPLN. INFO.:			JP 2004-324022	20041108

ED Entered STN: 26 May 2006
AB The electrolytes are made of polysiloxane bearing ≤2 connecting groups in Si-O linkages of main frameworks, wherein the polysiloxane bearing C:C bonds and proton-conductive groups. The electrolytes showing improve affinity with

noble metal catalysts due to C:C bonds can be selectively disposed nearby noble metal catalysts so as to improve gas-diffusion and water-discharge characteristics.

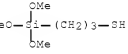
IT 887116-45-2DP, sulfonated
(electrolytes, catalyst electrode layers; polymer-electrolyte fuel cell containing polysiloxane electrolytes in catalyst electrode layers)

RN 887116-45-2 HCAPLUS

CN 1-Propanethiol, 3-(trimethoxysilyl)-, polymer with hexyltrimethoxysilane and trimethoxy-2-propenylsilane (9CI) (CA INDEX NAME)

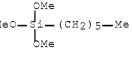
CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



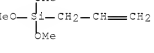
CM 2

CRN 3069-19-0
CMF C9 H22 O3 Si



CM 3

CRN 2551-83-9
CMF C6 H14 O3 Si



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38

ST polymer electrolyte fuel cell electrode polysiloxane; membrane electrode assembly polymer electrolyte fuel cell;

sulfonated polysiloxane electrode polymer electrolyte fuel cell

IT 887116-45-2DP, sulfonated
(electrolytes, catalyst electrode layers; polymer-electrolyte fuel cell containing polysiloxane electrolytes in catalyst electrode layers)

L34 ANSWER 22 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2005:1261744 HCAPLUS Full-text
DOCUMENT NUMBER: 144:38279
TITLE: Direct methanol fuel cells (DMFC), proton-conducting membranes with good methanol impermeability therefor, and manufacture thereof
INVENTOR(S): Miyama, Toshihito; Yamauchi, Kenji; Koma, Satoshi; Kano, Masashi
PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 20 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005332800	A	20051202	JP 2004-351634	20041203
PRIORITY APPLN. INFO.:			JP 2004-128346 A	20040423

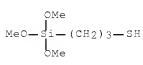
ED Entered STN: 02 Dec 2005

AB The membranes, useful for DMFC using polar organic solvent-containing liquid fuels, comprise a continuum of crosslinked Si-O-structured particles (with surface sulfonic acids), have fine through-holes between the particles, and show (a) ion exchange capacity ≥0.5 meq/g and (b) MeOH permeability ≤500 μmol/cm-day at 25° and/or (b') swelling ratio ≤5% after 24-h immersion in MeOH at 25°. Also claimed are the membranes complexed and reinforced with (hydrophilized) polymers (employing silane coupling agents). In preparation of the membranes, liquid mixts. containing compds. having mercapto groups and hydrolyzable silyl/silanol groups covalently bonded therewith are formed into films, wherein the silyl/silanol groups are subjected to (hydrolytic) condensation to give crosslinked films which are impregnated with hydrolyzable silyl/silanol-containing curing agents, water, and catalysts in liquid or gaseous state and heated. Then the mercapto groups are oxidized to give the surface sulfonic acids.

IT 4420-74-0DP, 3-Mercaptopropyltrimethoxysilane, polymers with tetraethoxysilane and silicone oligomers 161000-64-2DP, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, oxidized
(manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)

RN 4420-74-0 HCAPLUS

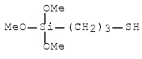
CN 1-Propanethiol, 3-(trimethoxysilyl)- (CA INDEX NAME)



RN 161000-64-2 HCAPLUS
CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

CRN 78-10-4
CMF C8 H20 O4 Si

IC ICM H01M008-02
ICS H01B001-06; H01B013-00; H01M008-10
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST proton conducting membrane methanol impermeability fuel cell; direct methanol fuel cell proton conductor; silicate fluoropolymer composite proton conducting membrane ; sol gel sulfo silsesquioxane silicate proton conductor
IT Polysiloxanes, uses
(alkoxy, KR 500, polymers with tetraethoxysilane and 3-mercaptopropyltrimethoxysilane; manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)
IT Silanes
(amino, coupling agents; manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)
IT Silicone rubber, uses
(bis(diethoxymethylsilyl)octane-bis(dimethylethoxysilyl)octane; manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)
IT Fluoropolymers, uses
(complexes with silsesquioxane-silicates; manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)
IT Silanes

(coupling agents; manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)

IT Silanes
(epoxy, coupling agents; manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)

IT Hybrid organic-inorganic materials
(manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)

IT Fuel cells
(polymer electrolyte; manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)

IT Ionic conductors
(polymeric, proton conductors; manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)

IT Sol-gel processing
(polymerization; manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)

IT Silsesquioxanes
(silicate-, sulfo-containing; manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)

IT Silsesquioxanes
(silicate-polysiloxane-; manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)

IT Polysiloxanes, uses
(silicate-silsesquioxane-; manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)

IT Amines, uses
Epoxides
(silyl, coupling agents; manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)

IT Polymerization
(sol-gel; manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)

IT 91-20-3D, Naphthalene, sodium complex, fluorine-containing 7440-23-5D, Sodium, naphthalene complex, fluorine-containing 870657-06-0, Furorobonda E 01
(PTFE treated with; manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)

IT 9002-88-4D, Polyethylene, complexes with silsesquioxane-silicates
(manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)

IT 78-10-4DP, Tetraethoxysilane, polymers with 3-mercaptopropyltrimethoxysilane and silicone oligomers 4420-74-0DP, 3-Mercaptopropyltrimethoxysilane, polymers with tetraethoxysilane and silicone oligomers 161000-64-2DP, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, oxidized
(manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)

IT 9002-84-0, PTFE
(porous films impregnated with mercapto-containing silsesquioxane-silicates; manufacture of proton-conducting

membranes with good methanol impermeability for direct methanol fuel cells)

IT 770733-64-7P
(rubber; manufacture of proton-conducting membranes with good methanol impermeability for direct methanol fuel cells)

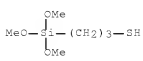
L34 ANSWER 23 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2005:1261095 HCAPLUS Full-text
DOCUMENT NUMBER: 144:24830
TITLE: Heat-resistant proton-conducting membranes, manufacture thereof, and fuel cells equipped therewith
INVENTOR(S): Yamauchi, Kenji; Koma, Satoshi; Miyama, Toshihito
PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 23 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 2
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.		DATE
JP 2005332801	A	20051202	JP 2004-351635		20041203
PRIORITY APPLN. INFO.:			JP 2004-128346	A	20040423

ED Entered STN: 02 Dec 2005
AB The membranes, comprising continuum of crosslinked Si-O-structured particles with surface sulfonic acids, have fine through-holes between the particles and show total pore volume (measured by BET method) ≤0.3 cm3/g and ion exchange capacity ≥0.7 meq/g. Also claimed are the membranes complexed and reinforced with (hydrophilized) polymers (employing silane coupling agents). In preparation of the membranes, hydrolyzable silyl/silanol group-containing mercaptans are mixed with water, catalysts, etc., and subjected to (hydrolytic) condensation to be thickened, formed into films (after preliminary hydrophilized porous fluoropolymers are impregnated with them), and fired to crosslink the residual hydrolyzable silyl groups to give porous membranes. Then the mercapto groups are oxidized to give the surface sulfonic acids.
IT 161000-64-2DP, oxidized
(manufacture of heat-resistant stable proton-conducting membranes for fuel cells)
RN 161000-64-2 HCAPLUS
CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

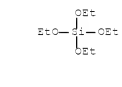
CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

CRN 78-10-4
CMF C8 H20 O4 Si



IC ICM H01B001-06
ICS C08G077-392; C08J005-22; C08J007-12; H01B013-00; H01M008-02; H01M008-10; C08L101-00
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38
ST proton conducting membrane heat resistance fuel cell; polymer electrolyte fuel cell proton conductor; silicate fluoropolymer composite proton conducting membrane ; sol gel sulfo silsesquioxane silicate proton conductor
IT Silanes
(amino, coupling agents; manufacture of heat-resistant stable proton-conducting membranes for fuel cells)
IT Fluoropolymers, uses
(complexes with sulfo-containing silsesquioxane-silicates; manufacture of heat-resistant stable proton-conducting membranes for fuel cells)
IT Silanes
(coupling agents; manufacture of heat-resistant stable proton-conducting membranes for fuel cells)
IT Silanes
(epoxy, coupling agents; manufacture of heat-resistant stable proton-conducting membranes for fuel cells)
IT Fuel cells
(polymer electrolyte; manufacture of heat-resistant stable proton-conducting membranes for fuel cells)
IT Ionic conductors
(polymeric, proton conductors; manufacture of heat-resistant stable proton-conducting membranes for fuel cells)
IT Sol-gel processing
(polymerization; manufacture of heat-resistant stable proton-conducting membranes for fuel cells)
IT Silsesquioxanes
(silicate-, sulfo-containing; manufacture of heat-resistant stable proton-conducting membranes for fuel cells)
IT Amines, uses
Epoxides
(silyl, coupling agents; manufacture of heat-resistant stable proton-conducting membranes for fuel cells)
IT Polymerization
(sol-gel; manufacture of heat-resistant stable proton-conducting membranes for fuel cells)
IT 9002-89-5, PVA
(PTFE hydrophilized with, complexes with sulfo-containing silsesquioxane-silicates; manufacture of heat-resistant stable proton-

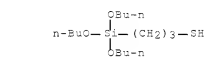
conducting membranes for fuel cells)
IT 91-20-3D, Naphthalene, sodium complex, fluorine-containing 7440-23-5D, Sodium, naphthalene complex, fluorine-containing 870657-06-0, FluoroBonder E 01
(PTFE treated with; manufacture of heat-resistant stable proton-conducting membranes for fuel cells)
IT 2530-83-8, S 510
(coupling agents; manufacture of heat-resistant stable proton-conducting membranes for fuel cells)
IT 9002-84-0, PTFE
(hydrophilized with PVA, complexes with sulfo-containing silsesquioxane-silicates; manufacture of heat-resistant stable proton-conducting membranes for fuel cells)
IT 161000-64-2DP, oxidized 161000-64-2DP, X 41-1805, oxidized
(manufacture of heat-resistant stable proton-conducting membranes for fuel cells)
IT 870657-03-7, Omnipore JGWP 14225
(membrane, complexes with sulfo-containing silsesquioxane-silicates; manufacture of heat-resistant stable proton-conducting membranes for fuel cells)

L34 ANSWER 24 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2005:1074109 HCAPLUS Full-text
DOCUMENT NUMBER: 143:369972
TITLE: Sol-gel reaction products, ion exchangers, protonic conductors, and membrane-electrode assemblies for fuel cells
INVENTOR(S): Kikuchi, Wataru; Wariishi, Koji
PATENT ASSIGNEE(S): Fuji Photo Film Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 34 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005272650	A	20051006	JP 2004-88345	20040325
PRIORITY APPLN. INFO.:			JP 2004-88345	20040325

ED Entered STN: 07 Oct 2005
AB The reaction products are prepared from Z1n1A1[Si(OR1)3-m1R2m1]n2 (A1 = mesogen-containing organic atomic group; R1 = H, alkyl, aryl, silyl; R2 = alkyl, aryl, heterocyclic ring; Z1 = polymerizable group for forming C-C bond or C-O bond by polymerization; m1 = 0-2; n2 = 1-8; n1 = 0-4), HO(SiR3R4)aH (R3, R4 = alkyl, aryl, alkoxy; a ≥2), and LSpB[Si(OR7)3-m4R8m4]n4 [R7 = H, alkyl, aryl, silyl; R8 = alkyl, aryl, heterocyclic ring; m4 = 0-2; n4 = 1-8; P = 1-5; L = H when P = 1, L = alkyl, aryl, heterocyclic ring, [Si(OR10)3-m5(R11)m5] when P = 2-5; R10 = H, alkyl, aryl, silyl; R11 = alkyl, aryl, heterocyclic ring; m5 = 0-2; B = linkage group with valency (p + n4)]. The protonic conductors show improved flexibility, mech. strength, and protonic conductivity, and low methanol permeability.
IT 42165-98-6DP, 3-Mercaptopropyltributoxysilane, oxidized, polymers with silanol-terminated polysiloxanes and mesogen-containing trialkoxysilanes
(crosslinked; sol-gel reaction products of mesogen- and polymerizable group-containing alkoxysilanes, silanol-terminated

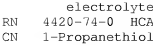
polysiloxanes, and S-containing alkoxysilanes for protonic conductors of fuel cells)
RN 42169-84-6 HCAPLUS
CN 1-Propanethiol, 3-(tributoxysilyl)- (CA INDEX NAME)



IC ICM C08G077-22
ICS B01D071-70; C08J005-20; H01B001-06; H01M008-02; H01M008-10; C08L083-08
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 76
IT 31692-79-2DP, Silanol-terminated polydimethylsiloxane, polymers with oxidized 3-mercaptopropyltributoxysilane and mesogen-containing trialkoxysilanes 42169-84-6DP, 3-Mercaptopropyltributoxysilane, oxidized, polymers with silanol-terminated polysiloxanes and mesogen-containing trialkoxysilanes 186972-90-7DP, polymers with oxidized 3-mercaptopropyltributoxysilane and mesogen-containing trialkoxysilanes 861098-45-5DP, polymers with oxidized 3-mercaptopropyltributoxysilane and silanol-terminated polysiloxanes
(crosslinked; sol-gel reaction products of mesogen- and polymerizable group-containing alkoxysilanes, silanol-terminated polysiloxanes, and S-containing alkoxysilanes for protonic conductors of fuel cells)

L34 ANSWER 25 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2005:1050042 HCAPLUS Full-text
DOCUMENT NUMBER: 144:413517
TITLE: Enhancement on proton conductivity of inorganic-organic composite electrolyte membrane by addition of sulfonic acid group
AUTHOR(S): Munakata, Hirokazu; Chiba, Hiroto; Kanamura, Kiyoshi
CORPORATE SOURCE: Department of Applied Chemistry, Graduate School of Engineering, Tokyo Metropolitan University, Hachioji, Tokyo, 192-0397, Japan
SOURCE: Solid State Ionics (2005), 176(31-34), 2445-2450
CODEN: SSIOD3; ISSN: 0167-2738
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 30 Sep 2005
AB A proton-conducting porous silica matrix for composite membranes was prepared by introduction of sulfonic acid groups on the surface. The surface modification of pores in the porous silica membrane was performed by using 3-mercaptopropyltrimethoxysilane (SH oxidation method) or 1,3-propanesultone (direct reaction method). The sulfonated silica matrix exhibited high proton conductivity of 6.0 + 10-3 S cm-1 at 60 °C under 90% relative humidity. This value was about 400 times higher than that of unmodified silica matrix. The proton conductivity of the composite membrane filled by a proton-conducting gel polymer, 2-acrylamido-2-methyl-1-propanesulfonic acid (AMPS), was considerably enhanced by using the sulfonated silica matrix.

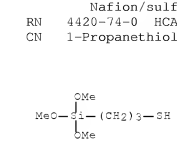
IT 4420-74-0DP, 3-Mercaptopropyltrimethoxysilane, reaction products with silica, oxidized
(enhancement on proton conductivity of silica-polystyrene hybrid electrolyte membrane by addition of sulfonic acid group)
RN 4420-74-0 HCAPLUS
CN 1-Propanethiol, 3-(trimethoxysilyl)- (CA INDEX NAME)



CC 37-6 (Plastics Manufacture and Processing)
Section cross-reference(s): 52
ST surface modification proton cond silica electrolyte membrane sulfonic acid
IT 1120-71-4DP, 1,3-Propanesultone, reaction products with silica
4420-74-0DP, 3-Mercaptopropyltrimethoxysilane, reaction products with silica, oxidized 188653-14-7DP, Snowtex ZL, reaction products with 1,3-propanesultone or 3-mercaptopropyltrimethoxysilane, oxidized
(enhancement on proton conductivity of silica-polystyrene hybrid electrolyte membrane by addition of sulfonic acid group)
REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 26 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2005:208443 HCAPLUS Full-text
DOCUMENT NUMBER: 142:449324
TITLE: Nafion/Sulfonated Montmorillonite Composite: A New Concept Electrolyte Membrane for Direct Methanol Fuel Cells
AUTHOR(S): Rhee, Chang Houn; Kim, Hae Kyung; Chang, Hyuk; Lee, Jae Sung
CORPORATE SOURCE: Department of Chemical Engineering, Pohang University of Science and Technology (POSTECH), Pohang, 790-784, S. Korea
SOURCE: Chemistry of Materials (2005), 17(7), 1691-1697
CODEN: CMATEX; ISSN: 0897-4756
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 10 Mar 2005
AB An organic species bearing an organic sulfonic acid (HSO3-) was grafted onto the surface of montmorillonite (MMT) by silane condensation, and the composite membranes were cast together with Nafion. The performance of the Nafion/HSO3-MMT composite membranes for direct methanol fuel cells (DMFCs) was evaluated in terms of methanol permeability, proton conductivity, and cell performance. The methanol permeability of the composite membrane decreased dramatically with increasing content of HSO3-MMT in the composite membrane. By rendering proton conductivity to MMT by functionalization with an organic sulfonic acid, the proton conductivity of the composite membrane was lowered only slightly from that of pristine Nafion 115. The combination of these effects led to a significant improvement in the performance of DMFCs made with Nafion/HSO3-MMT composite membranes.

IT 4420-74-0DP, 3-Mercaptopropyltrimethoxy silane, reaction products with acid-treated montmorillonite
(new electrolyte membrane for direct methanol fuel cells from Nafion/sulfonated montmorillonite composite)
RN 4420-74-0 HCAPLUS
CN 1-Propanethiol, 3-(trimethoxysilyl)- (CA INDEX NAME)



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 49, 76
IT Fuel cells
(proton exchange membrane; new electrolyte membrane for direct methanol fuel cells from Nafion/sulfonated montmorillonite composite)
IT 4420-74-0DP, 3-Mercaptopropyltrimethoxy silane, reaction products with acid-treated montmorillonite
(new electrolyte membrane for direct methanol fuel cells from Nafion/sulfonated montmorillonite composite)
REFERENCE COUNT: 34 THERE ARE 34 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 27 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2005:158336 HCAPLUS Full-text
DOCUMENT NUMBER: 142:222657
TITLE: Proton conductive membrane, its manufacture, and fuel cell thereof
INVENTOR(S): Miyama, Toshihito; Nomura, Shigeki
PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 30 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005050700	A	20050224	JP 2003-282006	20030729
PRIORITY APPLN. INFO.:			JP 2003-282006	20030729

ED Entered STN: 24 Feb 2005
AB The membrane has a crosslinked structure containing acid groups and metal-O bonding and is loaded with metal catalyst particles near the acid groups. The crosslinked structure contains XnSi(R2)3-nR1SO3H (X = crosslinking related -O- bonding or OH group, R1 = C≤20 hydrocarbon group, R2 = Me, Et, C3H7, or C6H5, n = 1-3, and the 2 R2 may be different when n =1), SiXm((R3)4-m (R3 = C≤20 alkyl group, m = 2-4), or R4lSiX3-1R5Si(R4)1X3-1 (R4 = Me, Et, C3H7, c4H9, or C6H5; R5 = C1-30 C containing mol. chain, 1 = 0-2). The membrane is manufactured by preparing the crosslinked structure, replacing the H+ in the

acid groups with a metal cation, and reducing the cation to deposit metal particles.

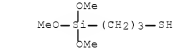
IT 161000-64-2DP, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, crosslinked, oxidized
(compns. and manufacture of proton conductive crosslinked electrolyte membranes containing metal catalyst particles for fuel cells)

RN 161000-64-2 HCAPLUS

CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

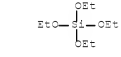
CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

CRN 78-10-4
CMF C8 H20 O4 Si



IC ICM H01M008-02
ICS C08J005-22; H01B001-06; H01B013-00; H01M008-10; H01M008-04; C08L085-00

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)

ST fuel cell catalytic metal proton conductive membrane compn manuf

IT Fuel cell electrolytes
(compns. and manufacture of proton conductive crosslinked electrolyte membranes containing metal catalyst particles for fuel cells)

IT 7440-06-4, Platinum, uses
(compns. and manufacture of proton conductive crosslinked electrolyte membranes containing metal catalyst particles for fuel cells)

IT 161000-64-2DP, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, crosslinked, oxidized
(compns. and manufacture of proton conductive crosslinked electrolyte membranes containing metal catalyst particles for fuel cells)

L34 ANSWER 28 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2004:1127708 HCAPLUS Full-text
DOCUMENT NUMBER: 142:59770
TITLE: Proton conductive film, its manufacture, and fuel cell thereof
INVENTOR(S): Nomura, Shigeki; Miyama, Toshihito
PATENT ASSIGNEE(S): Sekisui Chemical Co., Ltd., Japan
SOURCE: PCT Int. Appl., 61 pp.
CODEN: PIXXD2
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

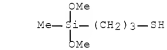
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004112177	A1	20041223	WO 2004-JP8487	20040610
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
RW: BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
CA 2525233	A1	20041223	CA 2004-2525233	20040610
EP 1635413	A1	20060315	EP 2004-746015	20040610
R: DE, FR, GB, IT				
CN 1806357	A	20060719	CN 2004-80016476	20040610
JP 3875256	B2	20070131	JP 2005-506993	20040610
TW 259600	B	20060801	TW 2004-93116842	20040611
US 20060141313	A1	20060629	US 2005-559082	20051202
KR 754095	B1	20070831	KR 2005-723806	20051212
PRIORITY APPLN. INFO.:			JP 2003-169848 A	20030613
			WO 2004-JP8487 W	20040610

ED Entered STN: 24 Dec 2004
AB A heat resistant H+ conductive film, having high dimensional stability and good high temperature H+ conductivity, is a continuous body of particles, which have metal-oxygen bond crosslinking structure, acid groups on their surface, and H+ passaged in the void among the particles. The particles acid group containing structure XnSi(R2)3-xR1SOI3H, where X = crosslink related -O- or OH group; R1 = C≤20 hydrocarbon group; R2 = Me, Et, Pr, C6H5; n = 1-3, and R2 may differ from each other when n ≥2. The film is manufactured by preparing a mixture of a compound, having mercapto group and mercapto group reactive hydrolyzable condensable silyl group and/or silanol group, and a polarization control agent; applying the mixture on a substrate to form a membrane, hydrolyzing and condensing the compound; and oxidizing the mercapto groups to form sulfonic acid groups.
IT 141098-23-9DP, oxidized 161800-64-2DP, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, oxidized 438245-54-6P 869281-44-5DP, oxidized
(proton conductive films from sulfonic acid group containing crosslinked siloxane particles for fuel cell electrolytes)

RN 141098-23-9 HCAPLUS
CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(dimethoxymethylsilyl)-1-propanethiol (9CI) (CA INDEX NAME)

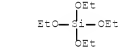
CM 1

CRN 31001-77-1
CMF C6 H16 O2 S Si



CM 2

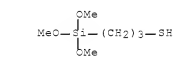
CRN 78-10-4
CMF C8 H20 O4 Si



RN 161000-64-2 HCAPLUS
CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

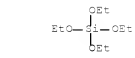
CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

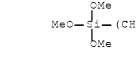
CRN 78-10-4
CMF C8 H20 O4 Si



RN 438245-54-6 HCAPLUS
CN Silicic acid (H4SiO4), tetraethyl ester, polymer with triethoxymethylsilane and 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

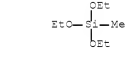
CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



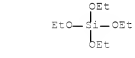
CM 2

CRN 2031-67-6
CMF C7 H18 O3 Si



CM 3

CRN 78-10-4
CMF C8 H20 O4 Si

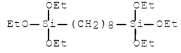


RN 809281-44-5 HCAPLUS
CN Silicic acid (H4SiO4), tetramethyl ester, polymer with

4,4,13,13-tetraethoxy-3,14-dioxa-4,13-disilahexadecane and
3-(trimethoxysilyl)-1-propanethiol (9CI) (CA INDEX NAME)

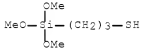
CM 1

CRN 52217-60-4
CMF C20 H46 O6 Si2



CM 2

CRN 4420-74-0
CMF C6 H16 O3 S Si



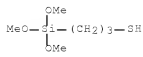
CM 3

CRN 681-84-5
CMF C4 H12 O4 Si

IT 161000-64-2D, X 41-1805, oxidized
(proton conductive films from sulfonic acid group containing
crosslinked siloxane particles for fuel cell electrolytes)
RN 161000-64-2 HCAPLUS
CN Silicic acid (H4SiO4), tetraethyl ester, polymer with
3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

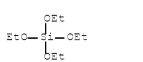
CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

CRN 78-10-4
CMF C8 H20 O4 Si



IC ICM H01M008-02
ICS H01B001-06; H01B013-00; C08J005-22; C08L101-00
CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
ST fuel cell metal oxygen crosslinked polysiloxane electrolyte membrane manuf; proton conductive crosslinked polysiloxane membrane fuel cell electrolyte
IT 141098-23-9DP, oxidized 161000-64-2DP, 3-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, oxidized 438245-54-6P 809281-44-5DP, oxidized
(proton conductive films from sulfonic acid group containing crosslinked siloxane particles for fuel cell electrolytes)
IT 161000-64-2D, X 41-1805, oxidized
(proton conductive films from sulfonic acid group containing crosslinked siloxane particles for fuel cell electrolytes)
REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 29 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2004:1005957 HCAPLUS Full-text
DOCUMENT NUMBER: 142:135452
TITLE: Organic-Inorganic Hybrid Membrane: Thermally Stable Cation-Exchange Membrane Prepared by the Sol-Gel Method
AUTHOR(S): Nagarale, R. K.; Gohil, G. S.; Shahi, Vinod K.; Rangarajan, R.
CORPORATE SOURCE: Central Salt Marine Chemicals Research Institute, Bhavnagar, 364002, India
SOURCE: Macromolecules (2004), 37(26), 10023-10030
CODEN: MAMOBX; ISSN: 0024-9297
PUBLISHER: American Chemical Society
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 23 Nov 2004

AB Organic-inorg. hybrid membranes based on poly(vinyl alc.)-SiO2 were prepared under acidic and basic conditions, in which sulfonic acid groups were introduced at the inorg. segment. These membranes were extensively characterized for their morphol., intermol. interactions, thermal and mech. stability, and physicochem. properties using SEM, transmission electron microscopy (TEM), Fourier transform IR (FTIR), thermogravimetric anal. (TGA), differential scanning calorimetry (DSC), dynamic mech. anal. (DMA), and water uptake studies. Schematic models for acid-catalyzed linear weakly polymeric clusters and for base-catalyzed highly branched polymeric clusters were proposed. A higher ion-exchange capacity, permselectivity, and conductivity for the acid-catalyzed hybrid membranes than for the base-catalyzed membranes with the same composition indicated that the former route is suitable for the preparation of ion-exchange membranes. The electrochem. properties of the membrane and the equivalent pore radius were found to be highly dependent on Si content in the membrane phase. It was concluded that a definite compromise between the silica content and the membrane ion-exchange properties is required in order to have an organic-inorg. hybrid cation- exchange membrane. Furthermore, the physicochem. and electrochem. properties of these membranes were comparable to those of Nafion membrane, which suggests that they may be suitable for fuel cell and chlor-alkali applications as a substitute for Nafion membrane.

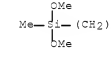
IT 827318-74-1DP, oxidized
(thermally stable organic-inorg. hybrid cation-exchange membrane prepared by sol-gel method)

RN 827318-74-1 HCAPLUS

CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(dimethoxymethylsilyl)-1-propanethiol, ethenol and formaldehyde (9CI) (CA INDEX NAME)

CM 1

CRN 31001-77-1
CMF C6 H16 O2 S Si



CM 2

CRN 557-75-5
CMF C2 H4 O

CM 3

CRN 78-10-4

CMF C8 H20 O4 Si

CM 4

CRN 50-00-0
CMF C H2 O

CC 37-5 (Plastics Manufacture and Processing)
Section cross-reference(s): 35, 36
ST polyvinyl alc silica org inorg hybrid ion exchange membrane; morphol thermal mech physicochem electrochem membrane
IT Ion exchange
(capacity; thermally stable organic-inorg. hybrid cation-exchange membrane prepared by sol-gel method)
IT Polymerization catalysts
(effect on thermally stable organic-inorg. hybrid cation-exchange membrane prepared by sol-gel method)
IT Sol-gel processing
(polymerization; thermally stable organic-inorg. hybrid cation-exchange membrane prepared by sol-gel method)
IT Permeability
(selective; thermally stable organic-inorg. hybrid cation-exchange membrane prepared by sol-gel method)
IT Polymerization
(sol-gel; thermally stable organic-inorg. hybrid cation-exchange membrane prepared by sol-gel method)
IT Cation exchange membranes
Electric conductivity
Electroosmosis
Glass transition temperature
Hybrid organic-inorganic materials
Polymer morphology
Pore size
Thermal stability
(thermally stable organic-inorg. hybrid cation-exchange membrane prepared by sol-gel method)
IT 7732-18-5, Water, processes
(absorption; thermally stable organic-inorg. hybrid cation-exchange membrane prepared by sol-gel method)
IT 1336-21-6, Ammonia water 7647-01-0, Hydrochloric acid, uses
(effect on thermally stable organic-inorg. hybrid cation-exchange membrane prepared by sol-gel method)

IT 7647-14-5, Sodium chloride, processes
(permselectivity of thermally stable organic-inorg. hybrid cation-exchange membrane prepared by sol-gel method)
IT 827318-74-1DP, oxidized
(thermally stable organic-inorg. hybrid cation-exchange membrane prepared by sol-gel method)
REFERENCE COUNT: 40 THERE ARE 40 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

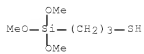
L34 ANSWER 30 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2004:938522 HCAPLUS Full-text
DOCUMENT NUMBER: 142:94941
TITLE: Proton conducting borosiloxane-poly(ether-sulfone) composite electrolyte
AUTHOR(S): Fujinami, Tatsuo; Miyano, Daisuke; Okamoto, Tadaaki; Ozawa, Masahiko; Konno, Akinori
CORPORATE SOURCE: Department of Materials Science, Faculty of Engineering, Shizuoka University, Hamamatsu, 432-8561, Japan
SOURCE: Electrochimica Acta (2004), 50(2-3), 627-631
CODEN: ELCAAV; ISSN: 0013-4686
PUBLISHER: Elsevier B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 08 Nov 2004
AB Proton conducting polymer composite membranes were prepared by casting method from borosiloxane electrolyte containing sulfonic acid groups and partially sulfonated poly(ether-sulfone) (SPES) or styrene-ethylene-butylene triblock rubber (SEBS). Proton conductivity of the composite membranes exhibited high ionic conductivity, stability to oxidation, and good film forming ability. Silica coating on the composite membrane improved water resistance.
IT 819084-64-5P, n-Hexyltrimethoxysilane-(3-Mercaptopropyl)trimethoxysilane-triisopropyl borate copolymer
(membrane component; proton conducting borosiloxane-poly(ether-sulfone) and borosiloxane-SEBS composite electrolyte membranes)
RN 819084-64-5 HCAPLUS
CN Boric acid (H3BO3), tris(1-methylethyl) ester, polymer with hexyltrimethoxysilane and 3-(trimethoxysilyl)-1-propanethiol (9CI) (CA INDEX NAME)

CM 1

CRN 5419-55-6
CMF C9 H21 B O3

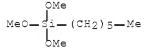
CM 2

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 3

CRN 3069-19-0
CMF C9 H22 O3 Si



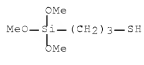
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 39
IT Styrene-butadiene rubber, uses
(hydrogenated, block, triblock, membrane component; proton conducting borosiloxane-poly(ether-sulfone) and borosiloxane-SEBS composite electrolyte membranes)
IT Polysulfones, uses
(polyether-, sulfonated, membrane component; proton conducting borosiloxane-poly(ether-sulfone) and borosiloxane-SEBS composite electrolyte membranes)
IT Polyethers, uses
(polysulfone-, sulfonated, membrane component; proton conducting borosiloxane-poly(ether-sulfone) and borosiloxane-SEBS composite electrolyte membranes)
IT 7631-86-9P, Silica, uses
(membrane coatings; proton conducting borosiloxane-poly(ether-sulfone) and borosiloxane-SEBS composite electrolyte membranes)
IT 81908-64-5P, n-Hexyltrimethoxysilane-(3-Mercaptopropyl)trimethoxysilane-triisopropyl borate copolymer
(membrane component; proton conducting borosiloxane-poly(ether-sulfone) and borosiloxane-SEBS composite electrolyte membranes)
IT 694491-73-1D, hydrogenated
(styrene-butadiene rubber, membrane component; proton conducting borosiloxane-poly(ether-sulfone) and borosiloxane-SEBS composite electrolyte membranes)
REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 31 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2004:839092 HCAPLUS Full-text
DOCUMENT NUMBER: 142:25775
TITLE: Hybrid proton-carrier polymer composites for

high-temperature FCPEM applications
AUTHOR(S): Pern, F. J.; Turner, J. A.; Herring, A. M.
CORPORATE SOURCE: National Renewable Energy Laboratory, Golden, CO, 80401, USA
SOURCE: Materials Research Society Symposium Proceedings (2004), 822(Nanostructured Materials in Alternative Energy Devices), 159-164
CODEN: MRSPDH; ISSN: 0272-9172
PUBLISHER: Materials Research Society
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 14 Oct 2004
AB Hybrid proton-carrier polymer composites were fabricated in an effort to develop high-performance high-temperature proton exchange membranes (PEMs) for fuel cell applications in the 100°-200 °C range. The solution-cast hybrid membranes comprise a polymer host and a SiO2-based proton-carrier composite that was synthesized via sol gel approach using a functional silane and tetraethoxysilane (TEOS) in acidic conditions. The primary H+-carrying component was either a heteropoly silicotungstic acid (STA) or a sulfonic acid (SFA) that was thermo-oxidatively converted from a mercapto (-SH) group. The embedding level of STA on the silane-modified SiO2 sol gel composites was strongly affected by the presence and the functional group of the silane. Ion exchange capacity (IEC) of the water-washed, SiO2-based STA and SFA proton-carrier composite powders is at 1.8-3.5 mmol/g, two to three times higher than that for Nafion 117 (0.9 meq/mol). A glycidyl methacrylate-type copolymer, PEMAGMA, which is stable up to .apprx.225 °C, was able to produce mech. robust and flexible hybrid membranes. Upon curing, the PEMAGMA composite membranes showed a .apprx. 75% gel under the present formulation and retained the free STA effectively with slight loss when extracted in an 85 °C water. The W12-STA-containing PEMAGMA membranes followed the weight loss trends of water from STA and the SiO2-based sol gel composite, showing a 10% loss at 150 °C and a 15% loss at 225 °C. Fuel cell performance tests of the preliminary films gave a Voc in the 0.85-0.93 V range, but a low c.d. of <4 mA/cm2. The resistive characteristics were attributed to inhomogeneous distribution of the sol gel nanoparticles in the PEMAGMA matrix, a result of phase separation and particulate agglomeration during film forming.
IT 180913-36-4DP, sulfonic acid derivative reaction products with hydrogen peroxide 438245-45-5DP, sulfonic acid derivative reaction products with hydrogen peroxide
(hybrid proton-carrier polymer composites for high-temperature FCPEM applications)
RN 180913-36-4 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 3-(trimethoxysilyl)propyl ester, polymer with 3-(trimethoxysilyl)-1-propanethiol (9CI) (CA INDEX NAME)

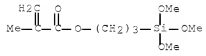
CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

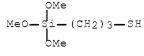
CRN 2530-85-0
CMF C10 H20 O5 Si



RN 438245-45-5 HCAPLUS
CN 2-Propenoic acid, 2-methyl-, 3-(trimethoxysilyl)propyl ester, polymer with silicic acid (H4SiO4) tetraethyl ester and 3-(trimethoxysilyl)-1-propanethiol (9CI) (CA INDEX NAME)

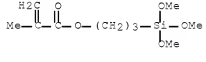
CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



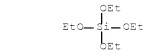
CM 2

CRN 2530-85-0
CMF C10 H20 O5 Si



CM 3

CRN 78-10-4
CMF C8 H20 O4 Si



CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 49, 57, 72, 76
ST hybrid proton conductive exchange membrane
polymer composite fuel cell
IT Ceramers
Composites
Ion exchange
Ion exchange membranes
(hybrid proton-carrier polymer composites for high-temperature FCPEM applications)
IT Fuel cells
(proton exchange membrane; hybrid proton-carrier polymer composites for high-temperature FCPEM applications)
IT 180913-36-4DP, sulfonic acid derivative reaction products with hydrogen peroxide 438245-45-5DP, sulfonic acid derivative reaction products with hydrogen peroxide
(hybrid proton-carrier polymer composites for high-temperature FCPEM applications)
REFERENCE COUNT: 10 THERE ARE 10 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L34 ANSWER 32 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2004:820246 HCAPLUS Full-text
DOCUMENT NUMBER: 141:317223
TITLE: Silane-modified polyamide-polyimide proton conductors, their membranes, manufacture of the conductors and membranes, and solid polymer electrolyte fuel cells
INVENTOR(S): Nakanishi, Shoji; Hase, Kohei
PATENT ASSIGNEE(S): Toyota Motor Corp., Japan
SOURCE: Jpn. Kokai Tokkyo Koho, 16 pp.
CODEN: JKXXAF
DOCUMENT TYPE: Patent
LANGUAGE: Japanese
FAMILY ACC. NUM. COUNT: 1
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004281066	A	20041007	JP 2003-66641	20030312
PRIORITY APPLN. INFO.:			JP 2003-66641	20030312

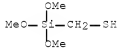
ED Entered STN: 07 Oct 2004
AB The proton conductors are manufactured by treatment of glycidol with (SH-containing) alkoxysilane partial condensates, ring-opening esterification of the resulting glycidyl ether-containing alkoxysilane partial condensates with polyamide-polyimides having carboxyl and/or acid anhydride end groups, and complexation of the resulting silane-modified polyamide-polyimides with solid acids, oxidation of the SH, or oxidation of the SH together with the

complexation. The membranes are manufactured by dissolving or dispersing the proton conductors in solvents, and removing solvents from the resulting solns. or sols. The membranes show high mech. strength at high temperature, resulting in the fuel cells capable of operating in severe condition.

IT 30817-94-8DP, Mercaptomethyltrimethoxysilane, reaction product with glycidol, Me silicate, and carboxyl- or carboxylic anhydride-terminated polyamide-polyimide, complex with silicotungstic acid
(manufacture of proton conductors comprising polyamide-polyimides modified with alkoxysilane-glycidol reaction products as electrolyte membranes for solid polymer electrolyte fuel cells)

RN 30817-94-8 HCAPLUS

CN Methanethiol, 1-(trimethoxysilyl)- (CA INDEX NAME)



IC ICM H01M008-02
ICS C08G073-10; H01B001-06; H01B013-00; H01M008-10

CC 52-2 (Electrochemical, Radiational, and Thermal Energy Technology)
Section cross-reference(s): 38, 76

IT 556-52-5DP, Epiol OH, reaction product with Me silicate and carboxyl- or carboxylic anhydride-terminated polyamide-polyimide, complex with silicotungstic acid 12002-26-5DP, Methyl Silicate 51, reaction product with glycidol and carboxyl- or carboxylic anhydride-terminated polyamide-polyimide, complex with silicotungstic acid 25053-57-0DP, 4,4'-Diphenylmethane diisocyanate-trimellitic anhydride copolymer, carboxyl- or carboxylic anhydride-terminated, reaction product with glycidol-Me silicate reaction product, complex with silicotungstic acid 30817-94-8DP, Mercaptomethyltrimethoxysilane, reaction product with glycidol, Me silicate, and carboxyl- or carboxylic anhydride-terminated polyamide-polyimide, complex with silicotungstic acid
(manufacture of proton conductors comprising polyamide-polyimides modified with alkoxysilane-glycidol reaction products as electrolyte membranes for solid polymer electrolyte fuel cells)

L34 ANSWER 33 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN

ACCESSION NUMBER: 2004:291271 HCAPLUS Full-text

DOCUMENT NUMBER: 140:305060

TITLE: Organic-inorganic hybrid polyorganosiloxane materials for ion-conducting membranes

INVENTOR(S): Kawabe, Kazuhiro; Kikugawa, Takashi; Kuraoka, Koji; Yazawa, Tetsuo

PATENT ASSIGNEE(S): Yamamura Glass Co., Ltd., Japan; National Institute of Advanced Industrial Science and Technology

SOURCE: Jpn. Kokai Tokkyo Koho, 11 pp.
CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

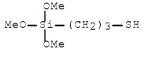
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004107597	A	20040408	JP 2002-275822	20020920
PRIORITY APPLN. INFO.:			JP 2002-275822	20020920

OTHER SOURCE(S): MARPAT 140:305060
ED Entered STN: 09 Apr 2004
AB The materials are manufactured by hydrolysis and polycondensation of R1mSi(OR2)4-m (R1, R2 = C1-3 alkyl; m = 0-2) with water, [addition of PhnSi(OR3)4-n (R3 = C1-3 alkyl; n = 1, 2)], addition of HSXSi(OR4)pR53-p (X = C1-5 alkylene; R4, R5 = C1-3 alkyl; p = 2, 3) and water, drying the resulting sol solns., and oxidation of the SH groups of the resulting solids to SO3H groups. Thus, a reaction product of tetraethoxysilane 89, phenyltriethoxysilane 38, and γ-mercaptopropyltrimethoxysilane 38 parts was cast into a membrane, which was immersed in 15% aqueous H2O2 solution and washed with water to give an ion-conductive membrane with elec. conductivity (at 25°, relative humidity 60%, 1000 Hz) ≥10-5 S/cm.
IT 161000-64-2P, γ-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer 676552-35-5P, γ-Mercaptopropyltrimethoxysilane-phenyltriethoxysilane-tetraethoxysilane copolymer
(organic-inorg. hybrid polyorganosiloxane materials for ion-conducting membranes)
RN 161000-64-2 HCAPLUS
CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

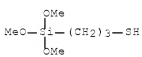
CRN 78-10-4
CMF C8 H20 O4 Si

RN 676552-35-5 HCAPLUS

CN Silicic acid (H4SiO4), tetraethyl ester, polymer with triethoxyphenylsilane and 3-(trimethoxysilyl)-1-propanethiol (9CI) (CA INDEX NAME)

CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

CRN 780-69-8
CMF C12 H20 O3 Si

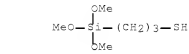
CM 3

CRN 78-10-4
CMF C8 H20 O4 Si

IT 161000-64-2DP, γ-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, oxidized 676552-35-5DP, oxidized
(organic-inorg. hybrid polyorganosiloxane materials for ion-conducting membranes)
RN 161000-64-2 HCAPLUS
CN Silicic acid (H4SiO4), tetraethyl ester, polymer with 3-(trimethoxysilyl)-1-propanethiol (CA INDEX NAME)

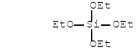
CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

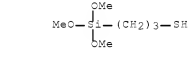
CRN 78-10-4
CMF C8 H20 O4 Si



RN 676552-35-5 HCAPLUS
CN Silicic acid (H4SiO4), tetraethyl ester, polymer with triethoxyphenylsilane and 3-(trimethoxysilyl)-1-propanethiol (9CI) (CA INDEX NAME)

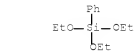
CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



CM 2

CRN 780-69-8
CMF C12 H20 O3 Si



CM 3

CRN 78-10-4
CMF C8 H20 O4 Si

IC ICM C08G077-28
ICS C08G077-392; H01B001-06; H01M006-18; H01M010-40
CC 38-3 (Plastics Fabrication and Uses)
Section cross-reference(s): 76
ST polyorganosiloxane mercaptosilane alkoxysilane phenylalkoxysilane hydrolysis polycondensation membrane; tetraethoxysilane phenyltriethoxysilane mercaptopropyltrimethoxysilane condensate membrane ion conductive
IT Membranes, nonbiological
(ion-conducting; organic-inorg. hybrid polyorganosiloxane materials for ion-conducting membranes)
IT Hybrid organic-inorganic materials
Ionic conductors
(organic-inorg. hybrid polyorganosiloxane materials for ion-conducting membranes)
IT Silsesquioxanes
(silicate-; organic-inorg. hybrid polyorganosiloxane materials for ion-conducting membranes)
IT 161000-64-2P, γ-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer 676552-35-5P, γ-Mercaptopropyltrimethoxysilane-phenyltriethoxysilane-tetraethoxysilane copolymer
(organic-inorg. hybrid polyorganosiloxane materials for ion-conducting membranes)
IT 161000-64-2DP, γ-Mercaptopropyltrimethoxysilane-tetraethoxysilane copolymer, oxidized 676552-35-5DP, oxidized
(organic-inorg. hybrid polyorganosiloxane materials for ion-conducting membranes)

L34 ANSWER 34 OF 34 HCAPLUS COPYRIGHT 2009 ACS on STN
ACCESSION NUMBER: 2003:827333 HCAPLUS Full-text
DOCUMENT NUMBER: 140:78131
TITLE: A new inorganic-organic negatively charged membrane: membrane preparation and characterizations
AUTHOR(S): Wu, Cuiming; Xu, Tongwen; Yang, Weihua
CORPORATE SOURCE: Department of Chemistry, University of Science and Technology of China, Hefei, 230026, Peop. Rep. China
SOURCE: Journal of Membrane Science (2003), 224(1-2), 117-125

CODEN: JMESDO; ISSN: 0376-7388
PUBLISHER: Elsevier Science B.V.
DOCUMENT TYPE: Journal
LANGUAGE: English
ED Entered STN: 22 Oct 2003

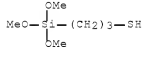
AB A new series of neg. charged inorg.-organic hybrid membranes were prepared by the sol-gel and oxidation processes of 3-(mercaptopropyl) trimethoxysilane (MPTS). The membranes were conducted IEC, streaming potential, and pure water flux measurements as well as SEM observation, FTIR and TGA anal. It is shown that IECs of the membranes increase with an increase of the coating times within a range of 1.0+10-2 to 2.3+10-2 meq. cm-2 for 1-4 coating times. The neg. charge of the membranes was tested by FTIR spectrum, IEC measurements as well as streaming potential values. The thermal stability was approved by TGA results which showed that the membranes could endure a temperature as high as 250 °C. The average pore diameter evaluated from pure water flux measurements ranged from hundreds of nm to several nm, depending mainly on the coating times and somehow on the sol composition Thus, by changing the coating times and sol composition, a series of membranes can be obtained to comply with the request for different pressure-driven processes.

IT 29295-80-5DP, 3-(Mercaptopropyl)trimethoxysilane homopolymer, oxidized 167427-18-1DP, oxidized
(mercaptopropyltrimethoxysilane dip-coated asym. microporous alumina membrane preparation and characterizations)

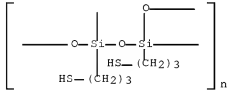
RN 29295-80-5 HCAPLUS
CN 1-Propanethiol, 3-(trimethoxysilyl)-, homopolymer (CA INDEX NAME)

CM 1

CRN 4420-74-0
CMF C6 H16 O3 S Si



RN 167427-18-1 HCAPLUS
CN Poly[[1,3-bis(3-mercaptopropyl)-1,3:1,3-disiloxanediylidene]-1,3-bis(oxy)] (CA INDEX NAME)



CC 38-3 (Plastics Fabrication and Uses)
ST silsesquioxane alumina asym microporous membrane cation exchange
IT Cation exchange membranes

(mercaptopropyltrimethoxysilane dip-coated asym. microporous alumina membrane preparation and characterizations)

IT 29295-80-5DP, 3-(Mercaptopropyl)trimethoxysilane homopolymer, oxidized 167427-18-1DP, oxidized
(mercaptopropyltrimethoxysilane dip-coated asym. microporous alumina membrane preparation and characterizations)

REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

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     FILE 'HCAPLUS' ENTERED AT 07:12:04 ON 26 JAN 2009
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                 SEL RN

     FILE 'REGISTRY' ENTERED AT 07:12:15 ON 26 JAN 2009
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                  OR 121-44-8/BI OR 141098-23-9/BI OR 142-84-7/BI OR
                 29295-80-5/BI OR 352211-30-4/BI OR 438245-54-6/BI OR
                 742079-37-4/BI OR 742079-38-5/BI OR 742079-40-9/BI OR
                 78-81-9/BI)
L3               STR
L4             9 SEA SSS SAM L3
L5             9 SEA ABB=ON  PLU=ON  L2 AND S/ELS

     FILE 'HCAPLUS' ENTERED AT 07:34:25 ON 26 JAN 2009
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L7             1 SEA ABB=ON  PLU=ON  L6 AND L1
L8            23 SEA ABB=ON  PLU=ON  L6 AND PROTON(2A)CONDUCT?

     FILE 'REGISTRY' ENTERED AT 07:35:59 ON 26 JAN 2009
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L10           50 SEA SSS SAM L9
L11         4576 SEA SSS FUL L9
L12            9 SEA ABB=ON  PLU=ON  L11 AND L2
                 SAV L11 TUR564/A
L13            9 SEA SUB=L11 SSS SAM L3
L14          125 SEA SUB=L11 SSS FUL L3
                 SAV L14 TUR564A/A
L15              STR L9
L16           50 SEA SUB=L11 SSS SAM L15
L17         1956 SEA SUB=L11 SSS FUL L15

     FILE 'HCAPLUS' ENTERED AT 07:48:11 ON 26 JAN 2009
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L20           33 SEA ABB=ON  PLU=ON  L18 AND PROTON(2A)CONDUCT?
L21         1517 SEA ABB=ON  PLU=ON  L19(L)PREP/RL
L22           34 SEA ABB=ON  PLU=ON  L21(L)PROTON(2A)CONDUCT?
L23           42 SEA ABB=ON  PLU=ON  L8 OR L22
L24           12 SEA ABB=ON  PLU=ON  L20 AND L23
L25            3 SEA ABB=ON  PLU=ON  L8 AND L20
L26           42 SEA ABB=ON  PLU=ON  L8 OR L22
L27           12 SEA ABB=ON  PLU=ON  L26 AND L18
L28           30 SEA ABB=ON  PLU=ON  L18 AND ((EXCHANG? OR CONDUCT?)(2A)MEMB
                 RAN? OR PEM OR MEA OR MEMBRANE ELECTRODE ASSEMBLY?)
L29           46 SEA ABB=ON  PLU=ON  L21 AND ((EXCHANG? OR CONDUCT?)(2A)MEMB
                 RAN? OR PEM OR MEA OR MEMBRANE ELECTRODE ASSEMBLY?)
L30           17 SEA ABB=ON  PLU=ON  L6 AND ((EXCHANG? OR CONDUCT?)(2A)MEMBR
                 AN? OR PEM OR MEA OR MEMBRANE ELECTRODE ASSEMBLY?)
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L32           14 SEA ABB=ON  PLU=ON  L31 AND (L30 OR L29)
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